

KU Leuven

Biomedical Sciences Group

Faculty of Medicine

Centre for Biomedical Ethics and Law



ETHICS OF RESEARCH BIOBANKS

ISLAMIC PERSPECTIVES IN AN INTERNATIONAL CONTEXT

Ghiath ALAHMAD

Jury:

Promoter: Prof. Kris Dierickx

Chair: Prof. Rik Lories

Jury members: Prof. Abdulaziz
Al-Swailem; Prof. Isabelle
Huys; Dr. Kristien Hens; Prof.
Martin Hiele; Prof. Sigrid
Sterckx; Prof. Peter Marynen

Dissertation presented in
partial fulfilment of the
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Dedication

I dedicate this thesis:

To my father, my wife, and my children.

&

To all innocent victims in Syria

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LIST OF ABBREVIATIONS

- AMA:** American Medical Association
- CIOMS:** Council for International Organization of Medical Sciences
- ECFR:** European Council for Fatwa and Research
- GCC:** The Cooperation Council for the Arab States of The Gulf
- ICH-GCP:** International Conference of harmonization- Good Clinical Practice
- IFA-India:** Islamic Fiqh Academy in India
- IFC:** Islamic Fiqh Council
- IIFA:** International Islamic Fiqh Academy
- IMANA:** Islamic Medical Association of North-America
- IOMS:** Islamic Organization of Medical Sciences
- IRB:** Institutional Review Board
- KAIMRC:** King Abdullah International Research Center
- KSAU-HS:** King Saud bin Abdulaziz University for Health Sciences
- NCMBE:** National Committee of Medical & Bioethics
- NGHA:** National Guard Health Affairs
- OECD:** Organisation for Economic Co-Operation and Development
- OIC :** Organization of the Islamic Conference
- SA:** Saudi Arabia
- SB:** Saudi Biobank
- SFDA:** Saudi Food and Drug Authority
- UAE:** United Arab Emirates
- UNESCO:** United Nations Educational, Scientific and Cultural Organization
- WHO:** World Health Organization

WMA: World Medical Association

Introduction

RESEARCH, BIOBANKS, ETHICS AND ISLAM. AN INTRODUCTION

An increasing number of medical studies are focusing on the genetics and the environment. Understanding inherited diseases is important in order to find new treatments. Many research centers around the world have started to establish biobanks for the purposes of acquiring tissue samples to advance genetic research and surveys.¹ However, large population-based research biobanks are not just enormous repositories of human biological materials (blood, saliva, DNA, etc.) they also contain an enormous amount of data, such as personal information, clinical data, genomic profiles, and medical history of the participants.^{2,3}

Research biobanks raise many ethical, legal, and social issues regarding things such as confidentiality and privacy,⁴ obtaining approval to participate in research,^{5,6} like one-time consent, the right to withdraw consent and the degrees of this withdrawal,⁶⁻⁸ issues related to commercial use of information including the possibility of selling it, intellectual property issues,⁹ and benefit to society.¹⁰

Confidentiality is an important principle in clinical and genetic research. Confidentiality clauses appear in many international documents, e.g., the Declaration of Helsinki, ICH-GCP, CIOMS guidelines, and the Universal Declaration on the Human Genome and Human Rights.³⁷ Moreover, the protection of patient information is considered a major ethical concern in research biobanks.¹¹⁻¹⁴ While it is generally acknowledged that the confidentiality of all information should be protected, this axiom is often ignored and sometimes violated in practice.¹⁵

Even though sample and data information is supposed to be collected on an individual basis, in practice, it is not. All family members share similar genetic profiles; moreover, in some societies where the tribal system is still strong, as in Saudi Arabia, the tribes have, to some degree, cognate genes. Stigmatization and harm will not be individual, but familial, and maybe tribal.¹⁶ In Muslim communities, where marrying relatives is often favoured, the family system is built on accurate selection criteria. In most cases, marriage decisions are not individual decisions, but familial ones; family image and certain stigma can often do play a role. Furthermore,

people who may wish not to be involved in research biobanking will still be indirectly involved, at least to some extent through samples collected from their close relatives. Respecting medical confidentiality is a basic issue in Islam. The disclosure of information may be justified for some reasons, especially to avoid larger harms. Even so, this disclosure must not cause discrimination and/ or stigma, which must be avoided according Islamic law.

Confidentiality in research is essential because participants disclose personal information by the participants to the research team. This disclosure must be voluntary for the participants and obtained by using a complete *informed consent* form, preapproved by Institutional Review Board. However, obtaining informed consent from the participants is a very complicated and controversial topic.^{7, 17-20} A vast body of literature has been published discussing the significance, limitations, and inadequacy of informed consent in promoting voluntary participation in research.²¹⁻²³ There are specific issues related to applying informed consent in research biobanks, such as sufficient information in consent, one-time consent for unlimited research on donated samples, and the degrees of withdrawal.

The principle of informed consent is even mentioned in Islamic law. Some issues have social effects (like who has to sign it) and must be investigated.

Obtaining samples from *children* for the biorepository is both crucial and problematic. Considering children's vulnerability and their need for greater protection, the inability to provide consent raises many ethical questions regarding their participation in research as well as sample submission for biobanks. These issues prompt many questions; such as whether or not children should be participants in biobanks, considering very little or no direct benefits, and some inherent risk to be associated with it; which should be the proper age for a child to be able to give consent; who should give consent for minors; is it sufficient to obtain consent from one parent and which parent? Bearing in mind that genes are shared with other family members, should these other members have rights in taking decisions about participation in research biobanks?¹⁶

Islam shares Western perspectives about offering protection to children. For examples, a guardian has to behave with according the best interests of the child in mind. However, differences may be found, especially concerning who the guardian is.

Other ethical issues relating to research biobanks, such as samples and information ownership of return of results, will not be discussed in this thesis. These issues require an extensive research and can be debated in other literature.

Main challenges in the three studied ethical issues

Main challenges in the three studied ethical issues	
Respect of confidentiality	Justified disclosure of information
	Prevent discrimination
	Prevent stigmatization
Informed consent	Obligation of informed consent
	Voluntary
	Ability to decide
	Enough information
	Understandable information
	Withdrawal
	Degrees of withdrawal
	One time consent
Children participation	Allowing research on children
	At which age child can participate
	Guardian consent
	Child assent
	Best interest of child
	Re-consent at adulthood
	Who is the guardian

RATIONAL AND IMPLEMENTATION OF DOCTORAL THESIS

Research biobanks can offer great benefits for science and health care. However, they raise many ethical challenges. These challenges may have different perspectives in Muslim countries, where some research biobanks start to appear.

The Saudi Biobank (SB) in Riyadh/Saudi Arabia is one of the newly established national research biobanks. It includes 200,000 participants, half of them having one or more common diseases, such as hypertension, asthma, and diabetes; the remaining participants are healthy individuals serving as controls for longitudinal studies.

The Saudi Biobank is very different from other biobanks, especially those in Europe and North America, because of the region's distinct social issues and its ethics system built on Islamic values and fatwas. Islamic opinion about any matter, especially recent matters is called a fatwa. Fatwas are usually issued by a scholar (called then an individual fatwa) or by a juristic council (called a plural fatwa). Plural fatwas are stronger than an individual one, and have an increasing interest.^{24,25} There are two main groups of Muslims: Sunni 87-90% of total number of Muslims, and Shia 10-13%. Saudi population is mostly Sunni.²⁶

The Saudi society is characterized by large family size (eight members on average) (Saudi Ministry of Planning, 2007), the presence of genetic isolates and semi-isolates, and, above all, by a very young population in general. It is important to note that 32.5% of the population is younger than 15 years old and only 2% is above the age of 65 years.^{27,28} There is a high rate of consanguinity and genetically inherited diseases in Saudi Arabia.²⁹ Considering these social parameters, the Saudi Biobank has been built with a focus on family repositories rather than individual ones.

Although the Saudi Biobank abides by global ethical values, such as autonomy, confidentiality, justice, protection, and the non-commercialization of human tissue, it is not clear whether these values are implemented, understood and interpreted to the same way in Saudi Arabia because they may be influenced by different social, cultural, and religious factors. Consequently, the transfer of these values and concepts to research biobanks is ambiguous and complex.

Obtaining informed consent and maintaining the confidentiality is a well discussed topic in medical research.³⁰ The Pub MED search using the words (confidentiality + research) results in more than 5,000 articles, however, none of these articles focuses on the Islamic society perspectives. To our knowledge, there is no empirical research related to the ethics of research biobanks, informed consent and participant's confidentiality in Islamic countries. We were also unable to find any report regarding the children's participation in medical research and biobanks in the Middle East. Considering the unique social, cultural and religious background in the Middle East, special attention should be given to maintain the autonomy and confidentiality of the research participants. This includes, but is not limited to, both confidentiality obligations and infringement justifications.

Participation of children in medical research is a poorly addressed issue in the Muslim countries, such as Saudi Arabia. Even if confidentiality and autonomy are shared human values among Muslims, applying those ethical principles to research biobanking in countries with a majority of Muslims, like Saudi, raises many questions. The first question is how the tradition and culture of this region is similar compared to the global standards and how are they different? The second question is: Can we successfully apply the autonomy and confidentiality concepts in research biobanking and genetic research in the Saudi Arabia or are they just putative concepts? And if we cannot apply them completely, what are the justifications for and possible risks of infringement? Will those infringements be accepted universally? Does participation of children in Saudi Biobanks have different challenges than what is seen in the western world? What is the position of Islam regarding pediatric research? In male-dominated tribal and Muslim communities such as the Saudi community,³¹ what role should the parents play? Additionally, who should be given the priority between the two parents in case of any conflict related to the participation of a child in a research study? In this study all people 18 years old and younger are called children, while those are above 18 are simply called people or persons.

In this PhD project we aim to investigate the ethical issues related to medical/biobanking research in the context of Islamic and Middle East countries. Based on this investigation, we will attempt to provide answers to the above mentioned questions and recommend guidelines which can be used by fellow researchers, policy makers, and ethics committees in the Islamic and Middle Eastern countries as well as other countries where Muslims are a component of society. We especially focus on three issues: confidentiality, informed consent and children participation in research biobanks which are very important and unsearched issues in Islamic and Middle East world.

Our proposed ethical inquiry and subsequent recommendations will be achieved by completing the following includes:

Part I: A state-of-the-art of current research ethics and practices is reviewed in the context of Islam and in the Middle East.

Our reviews are performed in two phases. In phase one, we investigate the influence of Islamic values on the confidentiality and participation of children in clinical research. We explore the issues related to patient

confidentiality and potential conflicts with this practice as a result of institutional fatwas* released by international, regional, and national Islamic Sunni juristic councils. We discuss how these fatwas affect research and publication by Muslim doctors, researchers, and Islamic medical organizations. Next we have investigated the guidelines from thirteen Arabic countries in the Middle East region considering the ethical principles stated in the international guidelines.

Part II: Empirical inquiries into current ethos of the Islamic community regarding confidentiality, informed consent and research on children.

To review the opinion of medical professionals in the Middle East region, we first perform semi-structured interviews with professionals who are actively involved in usage of stored tissue samples to perform genetic research. This qualitative study is followed by a survey among different professionals (medical doctors, students and researchers), lay people and participants in the Saudi biobank. We use SPSS 18.0 to perform statistical analysis.

Part III: A theoretical analysis of the existing governance of the Saudi biobank.

Saudi Biobank governance is investigated and checked against the concepts and themes derived from the first and the second phase of this study.

We examine the similarities, differences, strengths and weaknesses of the current governance of Saudi Biobank (SB) regarding three major ethical issues: confidentiality, informed consent and children's participation in research, compared to some selected western national biobanks. We evaluate these issues in relation to both international guidelines and Islamic law. Then we briefly explore the access policy for the scientific community towards SB.

Part IV: Developing an Islamic opinion on research biobanks in the Middle East and Islamic countries.

Based on the in-depth reflections of the previous parts, we will develop an opinion that reflects Islamic methods in reasoning and fatwas.

* A fatwa is a religious opinion concerning Islamic law about a specific matter.

Within our methodology, many factors have to be explored in order to get a better look at our inquiry about the ethics of research biobanks according to Islam. Our methodology includes exploring religious views through studying related fatwas, the impact of social factors and Islam on people in this area via empirical studies, and regulations placed on research and biobanks. All of these can lead to a view that may express the real situation about research biobanking perspectives in Muslim communities. However, communities in Saudi Arabia and the Arabic countries in the Middle East (where the quantitative and qualitative research was done) represent just a small proportion of the Islamic world. Therefore, we cannot guarantee that it will represent Muslims everywhere. We even attempted to study institutional fatwas that represent the plural opinions of Muslim scholars, many of whom do not share the same point of view.

Part V: Summary and conclusion

Next, we present our findings and formulate recommendations not only regarding the use of stored tissue samples in research, but also about including children and their tissues and about research ethics in general in the context of the Middle East. These recommendations can be used by researchers, ethics committees and policy makers.

OUTLINE OF THE DOCTORAL THESIS

The chapters that form the body of this thesis are composed of papers that have been published in or have been submitted to peer-reviewed journals. Therefore, they may contain some repetition in the introductory paragraphs.

In **Part I**, we present the current state of art. In **chapter 1** we present the Islamic position about medical and research confidentiality and the justified breaches of confidentiality. In **chapter 2** we provide the Islamic position regarding research on children. In **chapter 3** we provide a review of research ethics guidelines in 13 Arabic countries compared with international guidelines.

In **Part II**, we investigate the current ethos surrounding the topic of ethics of research biobanks in Islamic environment. In **chapter 4** we present findings of in-depth interviews of professionals in the Middle East area. In **chapter 5** and **chapter 6** we describe our findings of a survey about

confidentiality and children participation in research conducted on different groups in King Abdulaziz Medical City in Riyadh Saudi Arabia.

In **Part III**, in **chapter 7**, we describe our finding of a comparison of the governance of Saudi biobank with four different western biobanks. Then we describe access policy in SA biobank.

In **Part IV**, we apply our findings from part I, part II and part III to generate a normative reflection and develop an opinion about ethics of research biobank that we think reflects an Islamic position in the **chapter 8**.

In **Part V**, we present our findings, we provide recommendations for researchers and policy makers from professional organizations and give some suggestions for future research biobanks in Muslim countries and other countries that have Muslim minorities.

REFERENCES

1. Khoury, M. J., Millikan, R., Little, J., & Gwinn, M. (2004). The emergence of epidemiology in the genomics age. *International Journal of Epidemiology*, 33(5), 936-944.
2. Ethikrat, D. *Biobanks for Research: Opinion*. Deutscher Ethikrat, Berlin; 2004.
3. Andrews, L. B. (2005). Harnessing the benefits of biobanks. *The Journal of Law, Medicine & Ethics*, 33(1), 22-30.
4. Launis, V., & Räikkä, J. (Eds.). (2007). *Genetic democracy: philosophical perspectives* (Vol. 37). Springer.
5. Ducournau, P., & Cambon-Thomsen, A. (2009). Users and Uses of the Biopolitics of Consent: A Study of DNA Banks. In *The ethics of research biobanking* (pp. 33-47). Springer US.
6. Churchill, L. R., Collins, M. L., King, N. M., Pemberton, S. G., & Wailoo, K. A. (1998). Genetic research as therapy: Implications of "gene therapy" for informed consent. *The Journal of Law, Medicine & Ethics*, 26(1), 38-47.
7. Secko, D. M., Preto, N., Niemeyer, S., & Burgess, M. M. (2009). Informed consent in biobank research: a deliberative approach to the debate. *Social science & medicine*, 68(4), 781-789.
8. Elger, B. (2008). Withdrawal of consent and destruction of samples. In *Ethical Issues in Governing Biobanks: Global Perspectives* (131-166). Ashgate Publishing, Ltd.
9. Ursin, L. Ø., Hoeyer, K., & Skolbekken, J. A. (2008). The informed consenters. In *Biobanks: Governance in Comparative Perspective*, 177. Routledge.
10. Prainsack, B., & Buyx, A. (2013). A solidarity-based approach to the governance of research biobanks. *Medical law review*, 21(1), 71-91.
11. Ashcroft, R. (2000). The ethics of reusing archived tissue for research. *Neuropathology and Applied Neurobiology*, 26(5), 408-411..
12. Deschenes, M., Cardinal, G., Knoppers, B. M., & Glass, K. C. (2001). Human genetic research, DNA banking and consent: a question of 'form'?. *Clinical genetics*, 59(4), 221-239..
13. Gere, C., & Parry, B. (2006). The flesh made word: Banking the body in the age of information. *BioSocieties*, 1(01), 41-54..
14. Giordano, J., O'Reilly, M., Taylor, H., & Dogra, N. (2007). Confidentiality and autonomy: The challenge (s) of offering research participants a choice of disclosing their identity. *Qualitative Health Research*, 17(2), 264-275.
15. Beauchamp TL, Childress JF. (2013). *Principles of biomedical ethics*. 7th ed. New York: Oxford University Press.
16. Baumann, T. K. (2000). Proxy consent and a national DNA databank: an unethical and discriminatory combination. *Iowa L. Rev.*, 86, 667.
17. Clayton, E. W., & Ross, L. F. (2006). Implications of disclosing individual results of clinical research. *Jama*, 295(1), 33-38..
18. Godard, B., Schmidtke, J., Cassiman, J. J., & Aymé, S. (2003). Data storage and DNA banking for biomedical research: informed consent, confidentiality, quality issues, ownership, return of benefits. A professional perspective. *European Journal of Human Genetics*, 11, S88-S122.

19. Helgesson, G. (2005). Children, longitudinal studies, and informed consent. *Medicine, Health Care and Philosophy*, 8(3), 307-313.
20. Knoppers, B. M., Avard, D., Cardinal, G., & Glass, K. C. (2002). Children and incompetent adults in genetic research: consent and safeguards. *Nature Reviews Genetics*, 3(3), 221-225..
21. Boulton, M., & Parker, M. (2007). Informed consent in a changing environment. *Social science & medicine*, 65(11), 2187-2198..
22. Burgess, M. M. (2007). Proposing modesty for informed consent. *Social science & medicine*, 65(11), 2284-2295.
23. Miller, T., & Boulton, M. (2007). Changing constructions of informed consent: Qualitative research and complex social worlds. *Social science & medicine*, 65(11), 2199-2211.
24. Al-Zarga M. (1995). *Al-Fiqh al-Islami Wa Madaresoh (Islamic jurisprudence and its schools)*. Damascus: Dar Al-Shameia.
25. Ismail S. (1997). *Al-ijtihad al-jamai wa dawr al majamea al-fekhia fi tatbeekoh (Plural Ijtihad abd the role of jursitic councils of its use)*. Damascus: Dar al-basha'er al-islamia.
26. Pew Research Center., Pew Forum on Religion & Public Life. (2009). *Mapping the global Muslim population : a report on the size and distribution of the world's Muslim population*. Washington, District of Columbia: Pew Research Center.
27. Teebi, A. S. (2010). *Genetic disorders among Arab populations*. T. I. Farag (Ed.). Springer-Verlag.
28. Saudi Export Developing Center. Department of Statistics and Information. (2007). *Demographic Survey in 1428 AH (2007 AD)*. Riyadh, Saudi: Ministry of Economy and Planning; 2007.
29. Al-Gazali, L., Hamamy, H., & Al-Arrayad, S. (2006). Genetic disorders in the Arab world. *Bmj*, 333(7573), 831-834.
30. Kalra, D., Gertz, R., Singleton, P., & Inskip, H. M. (2006). Confidentiality of personal health information used for research. *BMJ*, 333(7560), 196-198.
31. Mobaraki, A. H., & Söderfeldt, B. (2010). Gender inequity in Saudi Arabia and its role in public health. *EMHJ*, 16(1).

PART I: Medical Research & Islam

Chapter 1

What Do Islamic Institutional Fatwas Say About Medical And Research Confidentiality And Breach Of Confidentiality?

Alahmad, G., & Dierickx, K.
(2012)..*Developing world bioethics*, 12(2), 104-112.

ABSTRACT

Protecting confidentiality is an essential value in all human relationships, no less in medical practice and research.¹ Doctor-patient and researcher-participant relationships are built on trust and on the understanding those patients' secrets will not be disclosed.² However, this confidentiality can be breached in some situations where it is necessary to meet a strong conflicting duty.³

Confidentiality, in a general sense, has received much interest in Islamic resources including the Qur'an, Sunnah and juristic writings.⁴⁻⁶ However, medical and research confidentiality have not been explored deeply. There are few fatwas about the issue, despite an increased effort by both individuals and Islamic medical organizations to use these institutional fatwas in their research.

Infringements on confidentiality make up a significant portion of institutional fatwas, yet they have never been thoroughly investigated. Moreover, the efforts of organizations and authors in this regard still require further exploration, especially on the issue of research confidentiality.

In this article, we explore medical and research confidentiality and potential conflicts with this practice as a result of fatwas released by international, regional, and national Islamic Sunni juristic councils. We discuss how these fatwas affect research and publication by Muslim doctors, researchers, and Islamic medical organizations.

We argue that more specialized fatwas are needed to clarify Islamic juristic views about medical and research confidentiality, especially the circumstances in which infringements on this confidentiality are justified.

BACKGROUND

The protection of patients in clinical practice and human participants in medical research is of the utmost concern to healthcare providers and researchers.⁷ Both clinical practice and research about individuals and groups require collecting information and data. However, exposure of this personal information can lead to physical or psychological harm to those individuals. Thus, healthcare providers and researchers are obligated to protect the confidential information of their clients.¹

Confidentiality is an important and shared human value. It is mentioned in international bioethical guidelines, such as the *Helsinki declaration*, the *Belmont report*, the guidelines of the *Council for the International Organization of Medical Sciences* (CIOMS), and many others.⁸⁻¹⁰

It is vital to establish positive, trusting relationships between doctors and patients and between researchers and their study participants. Confidentiality is not simply an expectation of patients built on trust nor just a legal matter.³ It also might raise rates of participation in research,^{11,12} which makes it very important to encourage research participants to disclose confidential information.^{13,14} Moreover, it involves an ethical responsibility to ensure that doctors and researchers are aware of the parameters of applying medical confidentiality. The issue of medical confidentiality becomes more serious when breaching privacy and confidentiality leads to discrimination (taking an action against or negative attitudes toward a person based on variations in his or her genome)¹⁵ or stigmatization (socially or economically categorizing people according to their attitudes, stereotypes, beliefs, or medical conditions)^{16,17}

Breaching confidentiality can be acceptable or required by medical authorities when failure to act could lead to physical harm to either to the patient or to people in contact with that patient; such is the case for progressive, infectious diseases, where the doctor or researcher has a duty to protect the health of those who may be at risk.³ Genetic diseases can also cause ethical conflict given that genetic information is not just individual, but also familial.³

Medical confidentiality is a type of confidentiality which is in general an important concept in Islam based on the three Islamic principles: first, the prohibition against backbiting, as mentioned in Quran: "neither backbite

one another" (Qur'an: Dwellings 12); second, the duty to protect secrets; and third, the consideration of the protection of confidentiality as a kind of loyalty, which has to be saved from harm. This is based on several Quranic verses, especially the verse where some characteristics have been highly appreciated: "Those who are faithfully true to their Amanât (all the duties which Allâh has ordained, honesty, moral responsibility and trusts) and to their covenants" (Qur'an: The believers 8).⁴⁻⁶

Institutional fatwas about medical confidentiality have not been studied and remain poorly understood by non-Arabic authors. Indeed, there is little to no research on the topic of confidentiality and Islam published in English.

METHODS AND RESOURCES

A fatwa is an Arabic word used in the Islamic jurisprudence, and means a religious opinion concerning Islamic law about a specific new matter issued by an Islamic scholar according general Islamic perspectives and depending on the primary Islamic resources like Qur'an, Sunnah, consensus, and analogy, besides some secondary resources. The mufti (the person who issues fatwa) must be well informed about both Islamic jurisprudence and about the matter of the fatwa to be issued.¹⁸

In recent decades a new mechanism has grown for the issuance of contemporary fatwas: the emergence of collective opinions through special institutions has been established for this purpose rather than individual opinions that dominated the long history of Islamic jurisprudence.¹⁹ In those institutes known as "juristic councils", a number of jurists and experts from various fields of juristic, cultural, scientific and economic knowledge meet together to study new problems of contemporary life and to provide integral solutions emanating from Islamic heritage and the evolution of Islamic thought.²⁰

According, the Sunni School individual fatwas are non-binding; institutional fatwas have more authority and some scholars even consider them as a kind of consensus, and consequently they understand institutional fatwas as binding, and can be abrogated only by another institutional fatwa.²¹ This legitimacy of institutional fatwas gives them more impact, compared with individual fatwas. On the other hand, we can see some overlapping between the individual and institutional fatwas, especially when members of these institutions issue their own fatwas

individually because the scholar may have a different opinion than the opinion taken by the institution, considering that the institutional fatwa is the opinion of the majority but not all of the members.²²

However, because there are neither well defined functions of these councils nor a clear system to choose their members, they face some difficulties. They only issue religious decisions but have no power to impose their fatwas legally for two reasons as understood by some authors: first because they are not established on a constitutional basis that guarantees their effectiveness, and secondly because they do not have well defined tasks. Even in the context of these difficulties, juristic councils remain the chief resource of fatwas that formulate Islamic point of view regarding many new matters.²³

These juristic councils are national, regional, or international in scope, as illustrated in Table 1.

National councils are established in each country separately, usually by the respective governments, and take a variety of names, like: Dar al-Ifta al-Massriyyah [Egypt] (<http://www.dar-alifta.org/default.aspx?LangID=1&Home=1>), General Presidency of Scholarly Research & Ifta [Saudi] (<http://www.alifta.net/Default.aspx>), and Islamic Fiqh Academy (India) (<http://ifa-india.org/index.html>).

The second type of juristic councils are those managed regionally, where a number of scholars from a few countries in a certain geographical area meet, independent of governmental supervision, such as the European Council for Fatwa and Research (ECFR) (<http://www.e-cfr.org/ar/>), the Assembly of Muslim Jurists of America (<http://www.amjaonline.com/>), and the Sharia Scholars Association of the Gulf Cooperation Council (<http://sslgcc.org/index.php>).

Finally, there are international juristic councils, of which there are only two: the International Islamic Fiqh Academy (<http://www.fiqhacademy.org.sa/>), which is a part of an inter-governmental organization called : The Organization of the Islamic Conference (OIC), and the Islamic Fiqh Council IFC (<http://www.themwl.org/bodies/default.aspx?d=1&bid=2&l=AR>), which is part of a larger, independent organization called the Muslim World League. Fatwas stated by both of these two international councils play a

significant role in international practice and, in fact, act as referees for regional organizations and researchers.^{3,5,24,25}

TABLE 1: Different Types of Juristic Councils

Juristic Councils	
International (Worldwide)	International Islamic Fiqh Academy
	Islamic Fiqh Council in the Muslim World League
International (Regional)	European Council for Fatwa and Research (ECFR)
	Assembly of Muslim Jurists of America
	Sharia Scholars Association of the Gulf Cooperation Council
	Assembly of scholars of countries of al-Sham
National (Examples)	General Presidency of Scholarly Research and Ifta [Saudi]
	Dar al-Ifta al-Massriyyah [Egypt]
	Islamic Fiqh Academy (India)
	Fatwa Committee of the National Council for Islamic Affairs Malaysia
	Islamic Religious Council of Singapore
	Dar al-Ifta (Palestine)
	The Presidency of Religious Affairs (The Republic of Turkey)
	Jordanian General Ifta Directory

Collections of fatwas released by these three types of councils can be found on their websites and in their publications, such as the Journal of the Islamic Fiqh Academy.

In addition to these formal councils, another form of group effort is emerging from a different kind of institute, such as the Islamic Organization for Medical Sciences (IOMS) (<http://www.islamset.com/ioms/code2004/index.html>) and the Islamic Medical Association of North-America (IMANA) (www.imana.org/). These institutes are not juristic councils but medical organizations or associations interested mainly in issues related to medicine. Although they do not release fatwas, they are interested in studying both juristic medical fatwas and the various aspects of Islam and medicine.

In addition, there are a few remarkable individual efforts to use these institutional fatwas. This effort involves both jurists, such as Ibn Baz and Al-Jubear, and medical doctors, such as Chamsi Pasha and Albar.^{26,27}

Because there are many similarities among the different Muslim doctrines with regard to new juristic issues, we have limited this study to Sunni jurisprudence schools because they represent a clear majority (87 %–90 %) in Muslim populations.²⁸

In this study, we survey institutional fatwas related to confidentiality in medical practice and research, and we compare them with the work of individual Muslim authors and with international documents. We include three types of juristic councils, including the only two universal juristic councils: the International Islamic Fiqh Academy and the Islamic Fiqh Council IFC; all regional councils (four councils): European Council for Fatwa and Research (ECFR), Assembly of Muslim Jurists of America, Sharia Scholars Association of the Gulf Cooperation Council and Assembly of scholars of countries of al-Sham, as well as eight national juristic councils: Dar al-Ifta al-Massriyyah [Egypt], General Presidency of Scholarly Research & Ifta [Saudi], and Islamic Fiqh Academy (India), Fatwa Committee of the National Council for Islamic Affairs Malaysia (<http://www.e-fatwa.gov.my/>), Islamic Religious Council of Singapore (<http://www.muis.gov.sg/cms/index.aspx>), Dar al-Ifta [Palestine] (<http://www.darifta.org/>), The Presidency of Religious Affairs [The Republic of Turkey] (<http://www.diyanet.gov.tr/arabic/default.asp>), and the Jordanian General Ifta Directory (<http://www.aliftaa.jo/index.php/ar/decisions/list>). We selected these eight national councils because they offer online access to their fatwas, either in Arabic or in Arabic and English.

Because of their broad-reaching intent, including answering ad hoc medical questions based on fatwas and the anonymity of their medical and juristic contributors, we have excluded certain Islamic web sites from this study: www.islamonline.net, www.islamweb.net, www.islamicity.com, www.islam.tc, www.islamtoday.com, and www.understanding-islam.com.²⁹

RESULTS

As the technology used in medical treatment and research rapidly evolves, many new ethical dilemmas have emerged. As a result, many Muslim doctors and researchers are increasingly asking for guidance on how to apply the laws of Islam in these cases. Juristic institutes have begun to reflect on these issues and to find solutions, issued in the form of fatwas. For this study, we have classified our results into two main categories: medical confidentiality and research confidentiality. However, we make a distinction for the conditions of justified breach of confidentiality for both categories, under a separate paragraph.

Medical confidentiality

A thorough review of current fatwas concerning medical confidentiality uncovered a special fatwa released by the International Islamic Fiqh Academy (A1: Table 2). This lengthy fatwa was included in its decision No. 79 (10 / 8) 1993, and addresses the obligation of maintaining medical confidentiality but states that, in some cases, it is both allowed and, indeed, mandatory to disclose confidential information.³⁰ These exclusions will be discussed below.

This fatwa invited ministries of health and health sciences colleges to include confidentiality in their programs; they encouraged the colleges to add this subject to their courses, to teach doctors about it, and to encourage their faculty to pursue research on the issue.³⁰

With the limited exception of the Fiqh Academy (India), no other fatwa related to medical confidentiality has been stated by national councils (Table 2).

Research confidentiality

In 2005, IOMS not only translated the "*International Ethical Guidelines for Biomedical Research Involving Human Subjects, 2002*" released by CIOMS⁹ but also compared all items in this document with relevant aspects of Islamic jurisprudence, thus clarifying the Islamic position on the issues presented in this document.³¹ In the section regarding confidentiality, this document includes some parts of the fatwa of the International Islamic Fiqh Academy about medical confidentiality No. 79 (10/8) 1993 (A1: Table 2); especially the obligation of confidentiality, and the conditions that justifies a breach.³¹

The international Islamic Fiqh Academy accepted and included this document in its fatwa number No. 161 (11/17) issued in June 2006 that discusses the Islamic perspectives on medical and biological research on human subjects.³² (B: Table 2).

The Islamic Fiqh Council (IFC) in the Muslim World League only addressed two issues directly, namely, genetic engineering and stem cell research.^{33,34} In fatwa number 1, cycle 15 (October 31, 1998), the council stipulated professional obligations in genetic research, such as the accurate evaluation of risk, informed consent, confidentiality, and maintaining respect for human dignity.³³ (C: Table 2) In fatwa number 3,

cycle 17 (January 1,2002), about stem cells, the council did not mention respect of confidentiality.³⁴

TABLE 2: Comparison of Councilor Fatwas about Confidentiality

		Results		
		Clinical Confidentiality	Research Confidentiality	Breach of Confidentiality
International councils (Worldwide)	International Islamic Fiqh Academy	Special fatwa about medical confidentiality No. 79 (10/8) 1993 (A1)	Confidentiality is included in fatwa No. 161 (11/17) June 2006 (B)	Special fatwa about medical confidentiality No. 79 (10/8) 1993 (A2)
	Islamic Fiqh Council in the Muslim World League	No fatwa	Confidentiality is included in fatwa number 1, cycle 15 (October 31, 1998) (C)	No fatwa
International councils (Regional)	European Council for Fatwa and Research (ECFR)	No fatwa	No fatwa	No fatwa
	Assembly of Muslim Jurists of America			
	Sharia Scholars Association of the Gulf Cooperation Council			
	Assembly of scholars of countries of al-Sham			
National councils	General Presidency of Scholarly Research and Ifta [Saudi]	No fatwa	No fatwa	No fatwa
	Dar al-Ifta al-Massriyyah [Egypt]			
	Fatwa Committee of the National Council for Islamic Affairs Malaysia			
	Islamic Religious Council of Singapore			
	Dar al-Ifta (Palestine)			
	The Presidency of Religious Affairs (Turkey)			
	Jordanian General Ifta Directory			
	Islamic Fiqh Academy (India)	No specific fatwa	No fatwa	Fatwa (8/1) 33/ 1995 regards the ethics and duties of a doctor. (D) Fatwa (8/1) 35/ 1995 regard ADIS and its rules. (E)

Not a single one of the national juristic councils have issued any fatwas on the issue of medical research or research confidentiality.

Justified infringements of confidentiality

In a fatwa (A2: Table 2) issued by the International Islamic Fiqh Academy, jurists affirmed that a breach of confidentiality can be acceptable only if the harm of maintaining confidentiality overrides its benefits.³⁰ In fact, this fatwa distinguished between two types of exclusions—conditions for which breaching confidentiality is required and those in which it is allowed but not required. This fatwa did not mention every case; however, it gave two forms, or examples, of each type. In cases in which a breach of confidentiality is obligatory, the intent of this breach must be to prevent harm either to society or individuals. In cases in which a breach of confidentiality is allowed but not required, the doctor or researcher must see that such a breach would bring benefits to an individual or society or be a means to prevent general harm.³⁰

This particular fatwa calls for national medical guidelines to detail the conditions under which a breach of confidentiality is necessary and both how and to whom this information should be reported. The fatwa recommended that authorities notify medical professionals about these conditions and procedures.³⁰

The Islamic Fiqh Academy (India) has not issued any special fatwa concerning medical confidentiality. However, the issue has been mentioned in two other fatwas.^{35,36} In its fatwa regarding the ethics and duties of doctors, the Indian Academy required that a patient's personal information be shared if it can be used as proof that someone did not commit a crime or to notify public safety authorities if a driver is impaired by poor vision or drug and alcohol use at the time an accident occurs (D: Table 2).³⁵ In another fatwa regarding AIDS, the council insists that it is not appropriate to hide a patient's disease (AIDS) if it may cause harm to their family or community (E: Table 2).³⁶

None of the juristic institutes have discussed specific cases in which confidentiality can be breached in medical research.

DISCUSSION

Medical Confidentiality:

Institutional interest in medical confidentiality can be seen in two kinds of fatwas: fatwas addressing confidentiality exclusively, such as the fatwa of the International Islamic Fiqh Academy (A1: Table 2),³⁰ and fatwas

addressing other medical issues that deal secondarily with confidentiality, such as the fatwas of the Islamic Fiqh Academy (India) (D & E: Table 2).^{35,36}

The first fatwa (A1: Table 2) is the most important fatwa to deal with confidentiality, because it is a detailed fatwa, and entirely focused on the confidentiality. It was issued in 1993 and clearly states the obligation of maintaining medical confidentiality in the medical profession.³⁰ Moreover; it elucidates some situations in which breaching confidentiality is allowed or mandatory.³⁰

Twelve years earlier, in 1981, the Islamic medical oath was developed by the IOMS during the first international conference about Islamic medicine; this oath contained a paragraph addressing respecting patients' confidential information.³⁷ This was the first institutional organization to make a statement about medical confidentiality from an Islamic point of view; individual scholars, such as al-Razi (825-925) and Ibn Abi Usaibia (1203-1270) had raised the issue long before.^{38,39}

Fatwa A1 (A1: Table 2)³⁰ had great influence and has been used as a cornerstone by many authors, such as Al-Jubear and Jundi, who are not necessarily interested in confidentiality but in sound medical practice.⁴⁰⁻⁴⁴ Even in this context, these scholars do not explore confidentiality in any real depth; instead, they frequently repeat one another's insistence on the obligation of confidentiality without touching on sensitive areas such as genetic information. A review of the literature on this subject identified only two books that specialize in medical confidentiality, those by Al-Jubear and Ahmad.⁴ Both authors and jurists explain confidentiality in general terms and try to apply Islamic principles about confidentiality to medical confidentiality using fatwa A1. However, we notice other authors, such as Arafea and Mubarak, are not aware of fatwa A1 and do not mention it in their publications.^{5,6}

The absence of any direct mention of medical confidentiality in the Qur'an and the Sunnah cause doctors and scholars to depend more on fatwa A1. For authors who were unaware of this fatwa, the absence of direct instruction in the Qur'an and the Sunnah did not cause any problems; they simply relied on the general Islamic principle of protecting confidentiality in order to construct an appropriate policy in the medical context. Muslim authors often refer to the three basic tenants of Islam that seem to apply: the prohibition against backbiting, the prohibition against any

unnecessary exposure of secrets, and the consideration of the protection of confidentiality as a kind of loyalty.^{4,5,7}

Fatwa A1³⁰ is compatible with nonreligious international guidelines, such as the Declaration of Helsinki and the Belmont Report, which state the importance and obligation of medical confidentiality.^{8,10}

Given the importance of fatwa A1,³⁰ it seems special that there are no other fatwas about confidentiality issued by other councils. What could be the reasons for this? Is it, perhaps, that medical confidentiality is not an important principle in Islamic jurisprudence? Or, perhaps fatwa A1 is enough to clarify the issue for Muslim doctors worldwide? Given the results of this research, it is our opinion that even though fatwa A1 is an important fatwa and sets forth an important ethical principle, jurists do not appear to be fully aware of the dimensions concerning confidentiality, especially in certain sensitive issues related to genetic diseases or sexually transmitted infections. Moreover, some of the juristic institutes listed here—specifically, the Sharia Scholars Association, the Gulf Cooperation Council Countries, and the Assembly of Scholars of Countries of al-Sham—are all newly established and either may not be interested in the issue of medical confidentiality or yet prepared to issue fatwas on such complex issues.

Research Confidentiality:

Our review of fatwas concerning medical research on both the national and international levels shows that there is a general lack of instruction in this area. Moreover, the few fatwas that do address these issues are more likely brief general statements that lack the specificity required for navigating the increasingly complex arena of medical research and research confidentiality.

It is our hypothesis that the reason that so few fatwas on the subject of research confidentiality and medical ethics have been issued is a reflection of the fact that the field of medical research is still relatively new, and despite the rapid progress in other developed countries, it is still in its infancy in most Muslim countries. As fatwas are traditionally written

in response to actual problems and pressing problems, this latter point seems especially germane.*

In 1998, the Islamic Fiqh Council (IFC) in the Muslim World League issued a fatwa (C: Table 2) that addressed the ethical obligations required in genetic research.³³ This fatwa was very narrow in focus, and the issue of confidentiality was given very little attention. As a result, this fatwa is insufficient.

The most important and comprehensive treatment of research ethics and Islam came in 2005 when the IOMS translated and analyzed the *"International Ethical Guidelines for Biomedical Research Involving Human Subjects"* from an Islamic perspective.³¹ The outcome was a document entitled *"International Ethical Guidelines for Biomedical Research Involving Human Subjects—Islamic View,"*³¹ which I believe is the most important statement concerning Islamic guidelines for medical research. In this document, the IOMS agrees with fatwa A1 regarding the obligation of confidentiality in medical practice.³¹

The IOMS document³¹ was so influential that after only one year, the Islamic Fiqh Academy referred to it and accepted it into their fatwa on the issue (B: Table 2).³² This reference only increases the credibility of the IOMS document,³¹ heightening the possibility that it will be used later by jurists and institutes when setting guidelines about medical ethics and research confidentiality.

The rare publications by individual Muslim scholars of research ethics and confidentiality from an Islamic point of view were influenced and began to change in light of both the IOMS document and fatwa (B).^{31,32} In 2008, the first specialized book concerning Islamic medical research ethics was published. The authors, Chamsi Pasha and Albar, are both experts at the International Islamic Fiqh Academy. In their text, they discuss confidentiality, with a special emphasis on genetic research, without delving deeply into the investigation of its dimensions or justified infringements.²⁶

To help jurists in councils issue fatwas, more studies on the issue of medical ethics and confidentiality are needed. Such research is especially important for sensitive cases involving sexually transmitted infections and

* For more information about the fatwa and how it works please go to the web site of Dar al-Ifta al-Massriyyah [Egypt] <http://www.dar-alifta.org/FatawaConcepts.aspx>

shared genetic information in tribal groups. Because of the emphasis that many Muslim communities place on lineage and the importance placed on procreation only within official and legal marriages, the issue of genetic research is especially important to Muslim communities.⁴⁵ Any breach of confidentiality related to paternity may lead to discrimination and stigmatization for the child or parent. Researchers who face these kinds of situations may not know what to do, considering the lack of fatwas on the subject.

In much medical research many sensitive data are included. This practice may involve significant risk of a breach in confidentiality, especially when information related to certain diseases lead to identify research subjects or their family, directly or indirectly - it is obvious the need to establish clear guidelines for Muslim researchers is very important.

Justified infringements of confidentiality

We observed that the attention of the Fiqh councils was focused on two main points, the mandatory obligation for maintaining medical confidentiality, and the justifications that allow a breach of medical confidentiality. In contrast with the first point, where fatwas were limited to pointing out the importance of confidentiality without giving details, fatwas that addressed the second point with some depth and identified many cases where a breach of confidentiality may be justified gives the impression that such fatwas give more importance to the protection of community, at the expense of maintaining the confidentiality of individuals and their interests. Actually, it appears that these particular fatwas were built on juristic rules such like the "public interest overrides individual interest".⁴⁶ However, we also note that those councils in turn failed to mention the public interest controls that regulate violation of medical confidentiality and to what extent breaches are permitted. In addition, it is noted that the issue of voluntary consent of the individual to allow the dissemination of confidential information had not been considered, neither the mechanism to implement that.

We could find only two institutional fatwas concerning breach of confidentiality: the fatwas A2 by Islamic Fiqh Academy and E by Islamic Fiqh Academy in India.^{30,35,36}

In fatwa A2, the Islamic Fiqh Academy differentiated between an obliged breach of confidentiality and one in which the doctor or researcher is

allowed to infringe on this agreement.³⁰ This fatwa, which was written in very general language, did not mention any specific cases and left room for more detailed studies in the future. Specifically, this fatwa did not identify the difference between what it called: "*the harm to society*" that is considered serious enough to require the breach of confidentiality, and "*the general harm*" that only allows the doctor or researcher to infringe on their patient's confidentiality; resulting in the perception that clarification of both terms are needed.

In addition to fatwa A2³⁰ and the IOMS document³¹, some authors have begun to discuss exceptions to the obligation of confidentiality. These justified situations have been adapted and quoted from the IOMS document;³¹ most commonly, these authors refer to cases in which the patients request that their information be shared, cases in which sharing the information is in the best interest of the patients or their community, cases in which the law or judicial authorities request the information (to prevent or solve crimes or provide evidence in court), cases in which the health of a wife or husband is at risk, or cases in which public health is in jeopardy (that is, to prevent outbreak of an infectious disease).³¹

Muslim jurists have used the five basic concerns of Islamic jurisprudence to deduce these exceptions: religion, life, mind, money, and progeny.^{27,40} This has been stated in fatwa A2.³⁰ Muslim jurists have built their opinions on various juristic rules,⁴ such as "choosing the lesser evil or greater good is always the priority"(Ibn Taymia) and the idea that the "public interest overrides individual interest".⁴⁶ However, these jurists do not discuss how to evaluate harm—that is, the difference between major or minor harm and what to consider when evaluating whether a breach in confidentiality is right or wrong.³⁰ These ideas are used as a basis for evaluation by scholars in the West. Beauchamp and Childress, for example, consider two factors in particular: the probability of harm and the magnitude of potential harm.³ No doubt, these are important points that will need to be studied in depth.

Though some Muslim authors in addition to the Islamic Fiqh Academy in India have discussed justified infringements of confidentiality (Fatwa E),^{30,31} these issues have not been investigated sufficiently. For instance, we did not find any studies equivalent to those conducted in Western countries, for example on the issue of AIDS. Studies such as "AIDS and Confidentiality" by Gillett, "AIDS and a Duty to Protect" by the Hastings Center, and "To tell or not to tell: breaching confidentiality with clients

with HIV and AIDS " by Hook & Cleveland have created a nuanced view of the problem outside of the Islamic context.⁴⁷⁻⁴⁹

Moreover, Islamic fatwas have not explored concerns about the disclosure of genetic information to third parties, an issue that is very important in modern medicine and has been extensively investigated by Western authors, such as Beauchamp & Childress, Andrews, and Parker & Lucassen.^{3,50}

Moreover, none of the institutes or the jurists provided specific cases of justified confidentiality infringement in the field of medical research. We assume, however, that these cases must occur in clinical research, especially in the context of research concerning sexually transmitted diseases or genetic research. Confidentiality infringements in relation to the publication of medical research are also a new area in which fatwas and additional research will be required in the future.

Despite the importance of both - keeping confidentiality, and justified breach as stated in these fatwas - none of the fatwas discuss the possible drawbacks for breaching confidentiality: for example, the case of undermining the trust of the patient in the doctor or the health care system. This obviously is an area that needs deep exploration, considering that is a right of patients or research participants.

CONCLUSION

There is no doubt that the maintenance of personal confidentiality is a shared value throughout the world. Islam, especially, places a high value on the principle of confidentiality in the broadest sense.

Confidentiality is an essential part of the modern profession of medicine. Confidentiality is built on trust, duty, and responsibility to the well-being of the patient. Preventing harm is also crucial in medical research.

Considering fatwas that have already been issued, medical confidentiality seems to be a very important issue; however, these fatwas do not go far beyond general studies and do not fully investigate the issue of patient confidentiality. Additionally, there is a lack of accurate and detailed research about medical confidentiality, especially in sensitive areas and in determining which cases may require an infringement of confidentiality.

Confidentiality in medical research is still not well explored from an Islamic point of view. More specialized fatwas and comprehensive studies are vital to properly elucidate the position that Muslim practitioners should take when ethical conflicts arise.

REFERENCES

1. Ryen A. Ethical issues. *Qualitative research practice*. 2004;230-247.
2. Giordano J, O'Reilly M, Taylor H, Dogra N. Confidentiality and autonomy: the challenge(s) of offering research participants a choice of disclosing their identity. *Qualitative health research*. Feb 2007;17(2):264-275.
3. Beauchamp TL, Childress JF. *Principles of biomedical ethics*. 7th ed. New York: Oxford University Press; 2013.
4. Ahmad A. *Ifsha'a al-Sirr al-Tibbi wa Atharoh fi al-Fikh al-Islami (Breaching of Medical Confidentiality and its Affect in Islamic Jurisprudence)*: Collage of Shariah and Law, al-Azhar University; 2007.
5. Mubarak K. Hal yakshif al-Tabib sirr al-Maridh (Does the doctor expose patient's secret?). *al-Multqa al-Sihhi*. 2002(27):22-25.
6. Arafea A. Sirr al-Mehna Wa Iltezam al-Tabeeb be Akhlaqiat al-Teb (Profession Confidentiality and Doctor's Observance to Medical Ethics). *al-Mutlaka al-Sihhi* 2001(19):16-18.
7. Cooper ZN, Nelson RM, Ross LF. Certificates of confidentiality in research: rationale and usage. *Genetic testing*. 2004;8(2):214-220.
8. World Medical Association (WMA). Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA: the journal of the American Medical Association*. 2013;310(20):2191.
9. Council for International Organizations of Medical Sciences (CIOMS), WHO. International ethical guidelines for biomedical research involving human subjects. In: Sciences CIOM, Organization WH, eds. Geneva: CIOMS; 2002.
10. National Institutes of Health (NIH). The Belmont Report. *Ethical Principles and Guidelines for the Protection of Human Subjects of Research*. Disponível em: <http://ohsr.od.nih.gov/guidelines/belmont.html#gob2>. Acesso em. 2011;26.
11. Hansson MG. Building on relationships of trust in biobank research. *Journal of medical ethics*. Jul 2005;31(7):415-418.
12. Johnsson L, Eriksson S, Helgesson G, Hansson MG. Making researchers moral: Why trustworthiness requires more than ethics guidelines and review. *Research Ethics*. 2014;10(1):29-46.
13. Smith E. The limits of sharing: an ethical analysis of the arguments for and against the sharing of databases and material banks. *Accountability in research*. Nov 2011;18(6):357-381.
14. Hiriscau IE, Stingelin-Giles N, Stadler C, Schmeck K, Reiter-Theil S. A right to confidentiality or a duty to disclose? Ethical guidance for conducting prevention research with children and adolescents. *European child & adolescent psychiatry*. 2014:1-8.
15. Epps PG. Genetic Discrimination. In: Post SG, ed. *Encyclopedia of Bioethics*. New York: Macmillan Reference; 2004:956 - 959.
16. Crocker J, Major B. Social stigma and self-esteem: The self-protective properties of stigma. *Psychological review*. 1989;96(4):608.
17. Corrigan O, Tutton R. *Genetic databases: Socio-ethical issues in the collection and use of DNA*: Psychology Press; 2004.

18. Al-Hanbali A. *Sefat al-fatwa wa al-Mufti wa al-Mustfti (Recipe of the fatwa, the Mufti and the requester)*. Damascus: Al-maktab Al-Islami; 1960.
19. Al-Zarga M. *Al-Fiqh al-Islami Wa Madaresoh (Islamic jurisprudence and its schools)*. Damascus: Dar Al-Shameia.; 1995.
20. International Islamic Fiqh Academy (IIFA). 1981; <http://www.fiqhacademy.org.sa/> Accessed September 24, 2014.
21. Al-Sultan A, Al-Abdulahadi A. *Al-Ijtihad ak-Jama'ee (Plural Ijtihad)*. Riyadh: Higher Institute of Justice, University of Imam Muhammad bin Saud Islamic University; 2009.
22. Islamic Fiqh Council (IFC). Islamic Fiqh Council in the Muslim World League. 1977; <http://www.themwl.org/bodies/default.aspx?d=1&bid=2&l=AR>. Accessed September 24, 2014.
23. Elkhamlichi A. Official site of Doctor Ahmed Elkhamlichi. <http://ahmed-elkhamlichi.org>. Accessed May, 20, 2014.
24. International Islamic Conference of Medical Practice Ethics. 2005; <http://www.saaaid.net/tabeeb/60.htm> Accessed September 24, 2014.
25. Ethikrat D. *Biobanks for Research: Opinion*. Deutscher Ethikrat, Berlin; 2004.
26. Chamsi Pasha H, Albar MA. *Akhlaqiat al-Bouhoth al-Tibia (Medical research ethics)*. Damascus: Alkalam Press; 2008.
27. Ibn Baz A. *Fatawa Ibn Baz*. Vol 9. Riyadh: Dar Alwatan. 1996.
28. Stencil S. Mapping the global Muslim population. Paper presented at: a report on the size and distribution of the World's Muslim population, the Pew Forum on Religion and Public Life, Washington DC: Pew Research Center; 2009.
29. Van den Branden S, Broeckaert B. Living in the hands of God. English Sunni e-fatwas on (non-) voluntary euthanasia and assisted suicide. *Medicine, Health Care and Philosophy*. 2011;14(1):29-41.
30. International Islamic Fiqh Academy (IIFA). *Decision about medical confidentiality*. 79 (8/10) 1993. <http://www.fiqhacademy.org.sa/grarat/8-10.htm>. Accessed September 24, 2014.
31. Islamic Organization for Medical Sciences (IOMS). International Ethical Guidelines for Biomedical Research Involving Human Subjects-Islamic View. In: Islamic Organization of Medical Sciences, ed. *Islamic universal charter of medical health ethics*. Kuwait: Islamic Organization for Medical Sciences; 2005:129-301.
32. International Islamic Fiqh Academy (IIFA). *Decision about juridical regulation of biomedical research on human*. . 161 (17/10). Amman 2006. <http://www.fiqhacademy.org.sa/grarat/17-10.htm>. Accessed September 24, 2014.
33. Islamic Fiqh Council (IFC). *Genetic engineering*. 1 (15)1998.
34. Islamic Fiqh Council (IFC). *Stem cells*. 3 (17). Makkah 2002. <http://www.themwl.org/Fatwa/default.aspx?d=1&cidi=152&l=AR&cid=12> . Accessed September 24, 2014.
35. Islamic Fiqh Academy-India (IFA-India). *The ethics and duties of a doctor*. . 33 (8/1). India. 1995. [40](http://ifa-

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- india.org/arabic.php?do=home&pageid=arabic_seminar8. Accessed September 24, 2014.
36. Islamic Fiqh Academy-India (IFA-India). *The ADIS and its rules*. . 35 (8/1)1995. http://ifa-india.org/arabic.php?do=home&pageid=arabic_seminar8. Accessed September 24, 2014.
 37. Islamic Organization of Medical Sciences (IOMS). *The Oath of Doctor. Paper presented at: First International Conference on Islamic Medicine*. Kuwait. 1981.
 38. Al-Razi M. *Akhlaq al-Tabib: Resala ila Ba'dh Talamethih (Ethics of Doctor: A Litter to Some Students)*. Cairo: Maktabet dar al-Turath 1970.
 39. Ibn Abi Usiabe'a M. *Auon Al-Ateba'a fi Tabakat Al-Atebba (Best News About the Categories of Doctors)*. Beirut: Dar Makatabet al-Hayat.
 40. Jundi A. Sirr al-Mihnat bain al-Kitman Wa al-Alaneia (Confidentiality of Medical Profession Between Keeping and Exposing). *Journal of Islamic Fiqh Academy*. 1994;8(3):117-126.
 41. Al-Jabouri A. Fiqh al-Tabib wa Adaboh fi al-Manthoor al-Islami (Jurisprudence and virtue of doctor according Islamic perspective). *Journal of Sharjah, University for religious and human sciences*. 2006(3):45-75.
 42. Al-Naqeeb A. *Al-leidad al-Tarbawi wa al-Mehani Lel Tabib (Educational and Professional Preparation of Doctor)*. Cairo: Dar al-Fikr al_arabi. Cairo: Dar al-Fikr al_arabi; 1984.
 43. Al-Turki YA. *Muslim Doctor Tamayz wa Semat (Muslim Doctor: Excellence and Features)*. <http://www.saaaid.net/tabeeb/1.htm>. Accessed September 24, 2014.
 44. Mohammed A. *Nafh'o al-Teib fi Aadab wa Ahkam al-Tabib (Good Inspiration of Virtue and Rules of Doctor)*. Tanta: Dar al-Sahaba lil Turath; 1990.
 45. Showman A. *Masader al-Tashrie'a (Resources of Islamic rules)*. Cairo: Al-Dar al-Thaqafia Li al-Nasher; 2000.
 46. Al-Zarga A. *Sharh al-Kwae'd al-Fekehea (Enlightenment of Juristic Rules)*. Damascus: Dar al-Qalam; 1989.
 47. Gillett G. AIDS and confidentiality. *Journal of applied philosophy*. 1987;4(1):15-20.
 48. Center H. *Hasting Center Report*: Hasting Center; 1987.
 49. Hook MK, Cleveland JL. To tell or not to tell: Breaching confidentiality with clients with HIV and AIDS. *Ethics & behavior*. 1999;9(4):365-381.
 50. Lucassen A, Parker M. Confidentiality and serious harm in genetics—preserving the confidentiality of one patient and preventing harm to relatives. *European Journal of Human Genetics*. 2004;12(2):93-97.

Chapter 2

Pediatric research ethics: Islamic perspectives

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ABSTRACT

Background: Children's participation is crucial in research on childhood diseases and cases associated with childhood health. Despite the existence of many publications that address ethical issues related to the participation of children in clinical research around the world, very little has been written about these ethical issues from an Islamic perspective.

Methods: In this study, we analyzed medical research on children from three Islamic resources: plural fatwas by juristic institutions, the opinions of Islamic medical organizations and individual writings. **Results:** Seven plural fatwas from three juristic councils could be found. Only four of them raise ethical concerns about research on children. Two documents from medical organizations were identified. **Conclusion:** Three different positions could be concluded from these fatwas: a total prohibition, prohibition unless and permission. Prevention any harm is a major concern in all fatwas. Guardian's consent is necessary, but more details are needed. The guidelines of Islamic Organization of Medical Sciences IOMS reflect the best available Islamic perspective about research on children.

INTRODUCTION

Scientific progress in the fields of biology, medicine, and health relies on research in these areas. Clinical research and medical experiments are important for obtaining better treatments for diseases with the least harmful effects.¹

Many researchers and pharmaceutical companies in the West opt to conduct research in third world countries for economic reasons or because most of these countries do not have strict ethical laws like those in the West.² Moreover, many researchers from developing countries conduct research activities in their own countries, including Muslim countries.³ At the same time, Western scholars have very little knowledge regarding Islamic ethical views on medical issues, including regulations

related to medical research, especially on children. Many hear about the Islamic Law, the Sharía, but very few know whether Islamic law on medical issues is compatible with or contradictory to international perspectives on medical research.

Children's participation is crucial in research on childhood diseases and cases associated with childhood health, such as vaccine-related issues, or cases related to drugs designed for children.⁴ In the past, many new medications were tested only on adults despite the fact that these medications were applicable to diseases that occur in childhood. This is also true for research on stored tissue material from children, which raises distinct ethical challenges with regard to the involvement of adults.⁵ However, children are not simply small adults, and we cannot always apply the results of research conducted on adults to children and young people. This is especially true for the safety of tested medications. Therefore, many research institutions and researchers feel that it is important to conduct research on children.⁶

Medical research in Arab countries is increasing rapidly. The high percentage of children in Arab and Islamic societies (compared to Western societies), as statistics show, makes conducting research on children a crucial issue. For example, according to statistics from 2007, 32.5% of the people in Saudi Arabia are 15 years old or younger. (Saudi Export Developing Center, 2007) Medical research on children has made room for ethical debates that reflect the publication of numerous recommendations, ethical laws and guidelines to achieve a balance between the need for children's participation in medical research and the duty to offer them protection and to avoid doing them harm, as expressed in the Declaration of Helsinki (adopted 1964; latest amendment, 2008)⁷ and the International Ethical Guidelines for Biomedical Research Involving Human Subjects (1982; revised, 2002) by Council for International Organizations of Medical Sciences.⁸

Key ethical issues addressed by bioethicists regarding clinical research on children include the following: first, researchers can conduct clinical research on children only when it aims to address a pediatric problem or to obtain knowledge related to the health needs of children and cannot be feasibly conducted to the same degree with adults; second, researchers should seek the consent of the parents or legal guardians of children participating in the research; third, researchers should obtain the

child's assent according to his ability; and fourth, the researchers should respect the child's desire to withdraw from participation in the research.⁹

Religious principles (including Islamic law) form a basis for many practical applications of medical regulations and ethical guidelines.¹⁰ The relationship between Islam and medical research on children has not yet been explored in depth. Despite the remarkable increase in the number of researchers, conducting medical research on children and the existence of many publications that address ethical issues related to the participation of children in clinical research around the world, very little has been written about these ethical issues from an Islamic perspective. This paper will provide a first step in filling this gap. The objective of this essay is to present Islamic opinions regarding medical research on children through an analysis of key Islamic resources on the Islamic attitude toward research on children.

METHODS

In this study, we analyze medical research on children from three Islamic resources: plural fatwas by juristic institutions, the opinions of Islamic medical organizations and individual writings.

A fatwa is a legal opinion concerning Islamic law. It is called a plural fatwa if it is issued by a group in a juristic council and an individual fatwa if it is issued by a single scholar.¹¹ Plural fatwas play an increasingly important role in representing Islamic views of some issues, especially new matters.¹² We included in our study all Arabic or English, Sunni, plural fatwas that could be accessed online.¹³ Our study focused on the Sunni school (87-90% of Muslims are Sunni Muslims and 10-13% are Shia).¹⁴ We excluded individual fatwas from our resources because there is a problem of selection of scholars. Moreover, after a random pilot survey of approximately 20 websites of scholars from various countries, we could not find any individual fatwas about research on children. Even more survey of medical fatwas mentioned in certain Islamic web used in previous research of fatwas about organ donation no fatwa related to medical research of children could be found: www.islamonline.net, www.islamweb.net, www.islamicity.com, www.islam.tc, www.islamtoday.com, and www.understanding-islam.com.¹⁵

In a recent review we showed that 14 juristic councils offer online access to their fatwas: two international councils, the International Islamic Fiqh

Academy (IIFA) and the Islamic Fiqh Council (IFC) in the Muslim World League (IFC); four regional councils covering Europe, America, the Gulf and Al-Sham (Syria, Jordan, Lebanon and Palestine); and eight national councils in Saudi, Egypt, India, Malaysia, Singapore, Palestine, Turkey, and Jordan.¹³ We surveyed all institutional juristic fatwas released by these institutions.

For the opinions of Islamic medical organizations, we concentrated on the two leading organizations that could be accessed online in either English or Arabic as found in a previous study: the Islamic Organization for Medical Sciences (IOMS) (<http://www.islamset.com/ioms/code2004/index.html>) and the Islamic Medical Association of North America (IMANA) (www.imana.org/).¹³ Although these are not juristic councils, they are medical organizations that adhere to Islamic law.

We excluded fatwas and opinions about embryonic stem cell research, anonymous fatwas and opinions on websites that do not represent official parties.

We continued by exploring related articles on the Islamic perspective on medical research on children. These articles were retrieved using search engines in both Arabic and English and by employing the search terms *research+Islam+children*. PubMed was used for English articles, and *The Comprehensive Encyclopedia* (الموسوعة الشاملة) www.islamport.com/ and *The Comprehensive Library* (المكتبة الشاملة) <http://shamela.ws/> were used to access Arabic resources. We also accessed the King Abdulaziz Public Library in Riyadh-Saudi and the Jarir and Obeikan bookshops.

We attempt to establish a generalized standpoint on research on children from an Islamic perspective. We analyzed the compatibility of this research with international views as stated in official documents, such as the Declaration of Helsinki, Good Clinical Practice GCP and the CIOMS guidelines.^{7,16,8}

RESULTS

Data collection

We retrieved nine different documents covering Islamic perspectives on one or more issues about clinical research (table 1).

We found seven different fatwas from three juristic councils between 1992 and 2008 and two opinions from medical organizations. Six of them have an international scope, and the

Table 1: Institutional fatwas about research on children

Year	Type of resource	Title	Subject	Author	Background of author	Scope	Size of document	
							Total document	The part about children
1992	Institutional fatwa	Decision 67 about medical treatment	Informed consent No harm Lacking capacity or incompetent	International Islamic Fiqh Academy IIFA	Juristic Council	International	73 lines	1 line
1997	Institutional fatwa	Decision 94 about cloning	Encourage research Cloning Genetic engineering	International Islamic Fiqh Academy IIFA	Juristic Council	International	105 lines	-
1998	Institutional fatwa	Decision 1/15 about genetic engineering	Genetic research Informed consent	Islamic Fiqh Council IFC	Juristic Council	International	48 lines	-
2002	Institutional fatwa	Decision 3/17 about stem cells	Stem cells research Informed consent Research on children	Islamic Fiqh Council IFC	Juristic Council	International	24 lines	1 line
2004	Institutional fatwa	Decision 142 about doctor responsibility	Encourage research	IIFA	Juristic Council	International		
2005	Opinion	International Ethical Guidelines for Biomedical Research Involving Human Subjects - An Islamic Perspective	All research ethics issues presented in CIOMS, including research on children	Islamic Organization for Medical Sciences IOMS	Medical Organization	International	190 pages	2 pages
2006	Institutional fatwa	Decision 161 Islamic controls of biomedical research on humans	Research integrity Approving of Islamic perspectives of CIOMS by IOMS Informed consent Protection (even from guardian) of those lacking capacity or incompetent	International Islamic Fiqh Academy IIFA	Juristic Council	International	60 lines	4 lines
2008	Institutional fatwa	Using of stem cells in research (598)	Stem cells research Informed consent Research on children	Dar-Alifta Al-Misriyah	Juristic Council	National (Egypt)	25 lines	1 line
No date	Opinion	Stem Cell Research: the IMANA perspectives	Genetic research & engineering Stem cells research Conceive to abort the fetus to obtain stemcells	Islamic Medical Association of North America IMANA	Medical Organization	Regional (North American)	16 pages	2 lines

seventh, by Dar-Alifta Al-Misrriyah (Egypt's Fatwa House),¹⁷ has a national scope. Only four of them raise ethical concerns about research on children and three address the subject generally.

Two documents from medical organizations were identified. One of them, by IOMS, has an international scope and includes a separate chapter for research on children.¹⁸ The second, by IMANA, has a North American scope and is not specific to children.¹⁹

The Dar-Alifta Al-Misrriyah' fatwa and the IMANA' document addressed stem cells in general.^{16,18} They were included because they were not limited to embryos; they also contained a section on research on adults or children.

Besides these fatwas from councils and opinions of organizations, few individual writings could be found, and none of them could be included in our results because they either presented a Shia point of view,²⁰ merely repeated fatwas and IOMS opinions without farther discussion;²¹ Fadel just copied the IOMS opinion in his article about the Islamic perspective of medical research,²² Abu Matar in her master thesis about the ethics of clinical trials talked about the guardians roles and used fatwa 67 of IIFA about preventing research on children especially in case of harm.²³

Research on children

Two questions arise from our results: Is it allowed to conduct research on children? And if the answer is yes, what are the allowing requirements? We discussed these two questions in two major themes: the position(s) toward conducting research on children and the requirements of research on children: ethics committee approval, best interest of child, no harm, informed consent of guardians and the assent of the child.

There are three different positions expressed by the studied documents. 1) Research on children is not allowed, as clearly stated by fatwa IIFA 67: "It is not allowed to conduct medical research on people who lack capacity or incompetents, even after guardian approval".²⁴ 2) Research on children is not allowed unless there are certain situations, as mentioned by IOMS: first situation, there is an exclusive or preponderant interest or an urgent need of the child in the research, even if the child refuses; second situation, it is absolutely necessary to conduct research on childhood diseases and vaccines and drugs related to children.¹⁸ Fatwa (IIFA 161)

accepts IOMS perspectives with regard to children in research.^{18,25} 3) Research on children is allowed; this position is taken by fatwa by Islamic Fiqh Council regarding stem cells and by Dar-Alifta Al-Misrriyah about using stem cells in scientific experiments (Table 2).^{17,26}

Table 2: Ethical concerns in research on children in Islamic resources

Document		IIFA 67	IFC 3/17	IOMS	IIFA 161	Dar-Alifta Al-Misrriyah (598)
Date		1992	2002	2005	2006	2008
Permission for research on children		No	Yes	No unless	No unless	Yes
Elements for conducting research on children	Best interest of child	Not applicable	Not available	Yes	Yes	Not available
	Obligation of guardian consent	No	Yes	Yes	Yes	Yes
	No harm	Yes	Yes	Yes	Yes	Yes
	Child assent	Not applicable	Not available	Yes	Not available	Not available
	Ethics committee	Not available	Not available	Yes	Not available	Not available

Five elements for conducting research on children can be identified in the documents that allow research on children: 1) ethics committee approval was not mentioned in any of the studied fatwas, but it is mentioned in IOMS guidelines.¹⁸ 2) the best interest of the child himself or the group of children^{7,8,25} 3) "no harm" is a prerequisite in all documents, even if the harm is only potential harm, as stated in fatwa 161 by International Islamic Fiqh Academy;²⁵ 4) guardian consent is necessary, but none of the documents provide details on who can be a guardian; 5) child assent is not clearly mentioned in any of the documents; however, IOMS states that the assent of the child cannot replace guardian consent.¹⁸

DISCUSSION

Research on children

Only few documents about research on children could be found in Islam. This is compatible with our results of a previous study about medical research in general in 13 Muslim countries in the Middle East, that showed that only three countries mentioned research on children in their guidelines.²⁷⁻³⁰ (See table 3)

Table 3: Children's research ethics in the guidelines of some Arab Middle Eastern countries

	Egypt	Saudi	Qatar
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	Profession Ethics Regulations	The law of ethics of research on living creatures	Guidelines, Regulations and Policies for Research Involving Human Subjects
Guardian consent	Yes	Yes	Yes
Child assent	-	Yes	Yes
Best interest of child	Yes	Yes	Yes
No more than minimal risks	-	Yes	Yes
Ethics committee	-	Yes	Yes

In the fatwas, we notice three different positions regarding clinical research on children: it is not allowed, it is not allowed unless in special situations and it is allowed. At the international levels, the Declaration of Helsinki and the CIOMS guidelines permit research on children under certain conditions.^{7,8}

The oldest fatwa (IIFA 67, 1992) issued more than 20 years ago, disallows research on children.²⁴ This prohibition can be explained by a limited awareness about the importance of research on children among the jurists of IIFA, and the lack of a complete and clear understanding of research on children. Moreover, jurists tend to take the safe side that offers better protection of children. This fatwa also reflects the poor participation of medical doctors and specialists in the formulation process of this fatwa,²³ since medical doctors are not full members in juristic council but they are just consultants.

Since that fatwa IIFA 67, other fatwas have been issued (IFC 3/17, 2002; IIFA 161, 2006; Dar-Alifta Al-Misrriyah 598, 2008) that allow research on children under certain conditions. That will be discussed below.^{17,25,26}

Islamic Organization Medical Sciences faced a challenge in dealing fatwa (IIFA 67), which disallowed research on children.²⁴ IOMS agrees to this prohibition, but then it provides two exceptions to allow research on children.¹⁸ These exceptions are: first, the research must be beneficial or address an urgent need for the child; second, there must be a general need for research on childhood diseases, provided that the potential risks are minimal.

The different positions between the IOMS opinion and IIFA's fatwa 67 can be attributed to the difference in the composition of the teams that formulated the documents. In contrast with the IIFA, the IOMS, which was

originally an Islamic-oriented medical institution, has a drafting committee composed of scholars in law and medical doctors and experts in medical research, and one of them is not even a Muslim.¹⁸

Conditions for research on children

Looking at the conditions at which the research on children is possible, the following five conditions are mentioned in the international guidelines such as CIOMS guidelines⁸: 1) Ethics committee approval of any research on children must be collected, 2) any research must be in the best interest of child, 3) risk of any research must be not more than minimum risk (do no harm), 4) consent must be collected from the child guardian and 5) if possible the assent of the child should be sought for. In the following, we discuss these five conditions in an Islamic perspective comparing them with international guidelines.

Ethics committee:

None of the fatwas refers to ethics committees. Only IOMS talks about the obligation of approval by research ethics committees prior to research on children.¹⁸ The obligation of an ethics committee approval has been mentioned in many international guidelines, such as the Declaration of Helsinki and the CIOMS,^{7,8} and now is considered one of the most important mechanisms to offer protection to research subjects especially when children are involved.

Best interest of child:

Fatwa IIFA 161 and IOMS mention the best interest as one of the conditions for allowing research on children.^{18,24} For IOMS the best interest of the child is either the beneficence of the individual child, or the beneficence of childhood community.¹⁸ This implies that therapeutic research, in contrast with IIFA 67 can be interpreted in a broader way: not primary beneficial of the individual child but beneficial to children in the same age.²⁴

In Islam, even if guardians can decide for the children's affairs, their decisions must always be in the best interest of the child. It is the parents' responsibility to provide care and protection for their children. Similarly, many Muslim and Western scholars agree that any decision of the parents must be considered within this framework.^{31,32} Taking into account the best interest of the child is the most obvious of respecting the child as a

human being.^{31,33} The best interest of child is a major concern in research on children and is mentioned in the Declaration of Helsinki and the IOMS opinion.^{7,18}

Do no harm:

The principle "do no harm" is stated by all documents including IOMS guidelines.²²

In Islam and internationally it is accepted that children are a vulnerable group; their protection is the responsibility of their guardians and the community at large.^{5,34} The government has the responsibility of controlling this protection through its regulations. This is clearly mentioned in fatwa (IIFA 161), which withdraws parental approval if the research causes harm to the child.²⁵ This fatwa is consistent with Muslim scholars' statements that the relationship between parents and children is not just a relationship of mercy and compassion but is also a relationship based on responsibility of parents toward their children, in raising them and offering them better care.³⁵

Although the documents in this study agree that any medical research to be performed on a child should not cause harm to that child, they do not define or specifically note the harm or its degree or state before it is possible to conduct research with minor risks. Only IOMS specifies that the potential risk should be minimal when conducting research on children.¹⁸ "Minimal risk," as stated by many authors in the west, is one of the criteria for allowing research on children.³⁶

Guardian consent:

Medical research can be conducted only after obtaining informed consent from the subject, if he is an adult, or from the guardian, if the subject is a child or is unable to give consent. Three fatwas IFC 3/17, IIFA 161 and Dar-Alifta Al-Misrriyah (598) and IOMS require getting guardian informed consent prior any research conducted on children.^{17,18,25,26} This prerequisite is also required in the international research ethics guidelines, such as the Declaration of Helsinki and CIOMS guidelines. It is also explicitly mentioned in the writing about ethics of research on children in both documents and individual writings.^{7,8,37}

Fatwas use word the "guardian", but they do not provide details about who is considered a guardian. The Helsinki Declaration in the context of

incompetent subject uses "authorized representative" while the CIOMS speaks about "guardian or parents".^{7,8} The Islamic position regarding who is a guardian, can be deduced from other fatwas or juridical sources such as Al-Mausoha Al-Feqhia (Juridical Encyclopedia) by the Ministry of Awqāf and Islamic Affairs.³⁸ For Islamic resources generally define the guardian in issues like the child's inheritance, but not for medical research or medical issues. Some authors, such as Shankeeti favor applying the general definition of guardians for medical issues.³⁹ Consequently, the priority of the guardians of a child according to Islamic resources can be classified as follows: fathers, then grandfathers, and then adult brothers, respectively.

Child assent:

Except for the IOMS opinion, child assent in research ethics is not mentioned in any of the documents.²² None of documents describes from which age on a child can give assent or when it becomes an adult and gives consent. Although not explicitly given a certain age for medical majority, the CIOMS and the Helsinki Declaration mention to the importance of considering child opinion.^{7,8} CIOMS stated that from 12-13 year on, the child opinion should be taken into account.^{7,8}

Table 4: Levels of ages according to Al-Mausoha Al-Feqhia.

Stage	Technique	Child's Actions		
Before the age of distinction	<7 years	Invalid		
Age of distinction (financial issues)	>7 years	Beneficial	Neutral	Harmful
		Valid	Related to other party	Invalid
Adult age (financial or criminal issues)	Majority age (defined by government)	Valid		

The age under which children can take decisions related to their health varies from country to country regulations.⁵ The ability to take decisions depends on the degree of capacity, which differs from one child to another and is affected by many factors, such as personal abilities and social context.^{36,40,41} A study by Stultiens et al. shows three different types of the relation between medical majority and legal majority: 1) they are the same, 2) they are different and 3) medical majority must be studied case by case depending on age and maturity.⁴² For Islam we can return to

the Al-Mausoha Al-Feqhia (Juridical Encyclopedia), which identifies the age of majority in financial and criminal issues, but not in medical issues.³⁸ It divides ages to three levels. At the first level, a child's decisions cannot be accepted when he/she is under the age of seven because he/she cannot understand the nature of the issue. At the second level, from seven years old to majority, we can only accept those decisions that are both correct and do not cause harm to the child. Decisions by children that are not to be considered correct, and/or cause harm to the child can be rejected by the guardian. The third level is majority. (Table 4) Al-Mausoha Al-Feqhia did not define a specific age for a child to be considered an adult; it referred to the laws of each country.³⁸ For example, the official documents of some Muslim countries stipulate different ages of majority: 18 years for Jordan,⁴³ 19 for Algeria,⁴⁴ 20 for Tunisia⁴⁵ and 21 for Egypt.⁴⁶

CONCLUSION

Despite the importance of the ethics of medical research on children, there are few Islamic documents on the subject, and they do not reflect the importance of this subject. The fatwas are brief and do not cover all aspects of the ethics of research on children. In ideas like assent and consent, fatwas do not develop a specific theory, but refer to other resources. Three different positions could be distinguished from these fatwas: a total prohibition by the oldest fatwa (IIFA 67), prohibition unless and permission by the fatwas later. Most of the conditions of research on children presented in the international guidelines like the Declaration of Helsinki and the CIOMS can be found in the fatwas, although a single fatwa does not mention all international conditions. However, the international requirement of approval by ethics committee cannot be found in the fatwas.

The detailed IOMS document is important and represents the most balanced available document that provides an Islamic perspective on clinical research ethics in general, including research on children. The view provided by IOMS is mostly compatible with international guidelines.

REFERENCES

1. Vermeire E, Hearnshaw H, Van Royen P, Denekens J. Patient adherence to treatment: three decades of research. A comprehensive review. *Journal of clinical pharmacy and therapeutics*. Oct 2001;26(5):331-342.
2. Kermani F. How to run clinical trials in the Middle East. *SCRIP*. 2002:1-8.

3. Royall J, Lyon B. Sea-change or change challenge? Health information access in developing countries: The U.S. National Library of Medicine experience. *African health sciences*. Sep 2011;11(3):457-463.
4. Burns JP. Research in children. *Critical care medicine*. Mar 2003;31(3 Suppl):S131-136.
5. Hens K, Nys H, Cassiman JJ, Dierickx K. Genetic research on stored tissue samples from minors: a systematic review of the ethical literature. *American journal of medical genetics. Part A*. Oct 2009;149A(10):2346-2358.
6. Macrae D. Conducting clinical trials in pediatrics. *Critical care medicine*. 2009;37(1):S136-S139.
7. World Medical Association (WMA). Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA: the journal of the American Medical Association*. 2013;310(20):2191.
8. Council for International Organizations of Medical Sciences (CIOMS), WHO. International ethical guidelines for biomedical research involving human subjects. Geneva: CIOMS; 2002.
9. Harth S, Thong YH. Parental perceptions and attitudes about informed consent in clinical research involving children. *Social science & medicine*. 1995;40(11):1573-1577.
10. O'NEILL O. Practical principles & practical judgment. *Hastings Center Report*. 2001;31(4):15-23.
11. Al-Hanbali A. *Sefat al-fatwa wa al-Mufti wa al-Mustfti (Recipe of the fatwa, the Mufti and the requester)*. Damascus: Al-maktab Al-Islami.; 1960.
12. Al-Zarga M. *Al-Fiqh al-Islami Wa Madaresoh (Islamic jurisprudence and its schools)*. Damascus: Dar Al-Shameia.; 1995.
13. Alahmad G, Dierickx K. What do Islamic institutional fatwas say about medical and research confidentiality and breach of confidentiality? *Developing world bioethics*. 2012;12(2):104-112.
14. Miller T. Mapping the global Muslim population: A report on the size and distribution of the world's Muslim population. Washington, DC: Pew Research Center. 2009.
15. Van den Branden S, Broeckaert B. Living in the hands of God. English Sunni e-fatwas on (non-) voluntary euthanasia and assisted suicide. *Medicine, Health Care and Philosophy*. 2011;14(1):29-41.
16. International Confernece of Harmonization. *Guidelines for Good Clinical Practice GCP*. <http://www.ich.org/products/guidelines/efficacy/article/efficacy-guidelines.html>. 2004.
17. Dar Alifta Al-Misrriyah. *Using stem cells in scientific experiments*. 598;2008.
18. Islamic Organization for Medical Sciences (IOMS). International Ethical Guidelines for Biomedical Research Involving Human Subjects-Islamic View. In: Islamic Organization of Medical Sciences, ed. *Islamic universal charter of medical health ethics*. Kuwait: Islamic Organization for Medical Sciences; 2005:129-301.
19. Fadel, H, Ahmed, W, Haque, M, Khan, F. Stem cell research: the IMANA perspective. *Islamic Medical Association of North America*. 2007.

20. Mobasher M, Salari P, Larijani B. Key Ethical Issues in Pediatric Research: Islamic Perspective, Iranian Experience. *Iranian Journal of Pediatrics*. 2012;22(4):435-444.
21. Chamsi Pasha H, Albar MA. *Akhlaqiat al-Bouhoth al-Tibia (Medical research ethics)*. Damascus: Alkalam Press; 2008.
22. Fadel HE. Ethics of Clinical Research: An Islamic Perspective. *Journal of the Islamic Medical Association of North America*. 2010;42(2).
23. Abu-Matar N. *Scientific experiments on Human*, Islamic University in Gaza; 2011.
24. International Islamic Fiqh Academy (IIFA). *Decision about medical treatment*. 67 (7/5). Vol 67. Jeddah 1992.
25. International Islamic Fiqh Academy (IIFA). *Decision about juridical regulation of biomedical research on human*. 161 (17/10). Amman 2006. <http://www.fiqhacademy.org.sa/qarat/17-10.htm>. Accessed September 24, 2014.
26. Islamic Fiqh Council (IFC). *Stem cells*. 3 (17). Makkah 2002. <http://www.themwl.org/Fatwa/default.aspx?d=1&cid=152&l=AR&cid=12>. Accessed September 24, 2014.
27. Alahmad G, Al-Jumah M, Dierickx K. Review of national research ethics regulations and guidelines in Middle Eastern Arab countries. *BMC medical ethics*. 2012;13:34.
28. National Committee of Medical & Bioethics (NCMBE). *The law of ethics of research on living creatures*. Riyadh: King Abdul Aziz City for Science and Technology; 2010.
29. Saudi Commission for Health Specialties. *Profession Ethics Regulations*, . the The Resolution of the Minister of Health & Population No. 238/2003. In: Ministry of Health and Population E, edRiyad; 2003.
30. Qatar. Ministry of Health. *Guidelines, Regulations and Policies For Research Involving Human Subjects*. Qatar: Ministry of Health; 2009.
31. Albar MA. Seeking remedy, abstaining from therapy and resuscitation: an Islamic perspective. *Saudi Journal of Kidney Diseases and Transplantation*. 2007;18(4):629.
32. Balen R, Blyth E, Calabretto H, Fraser C, Horrocks C, Manby M. Involving Children in Health and Social Research 'Human becomings' or 'active beings'? *Childhood*. 2006;13(1):29-48.
33. Freeman MD. Upholding the Dignity and Best Interests of Children: Internaitonal Law and the Corporal Punishment of Children. *Law & Contemp. Probs*. 2010;73:211.
34. Kabir M. Who is a parent? Parenthood in Islamic ethics. *Journal of medical ethics*. 2007;33(10):605.
35. Alwan AN. *Tarbiyyat Al-Awlad Fi Al-islam (Raising children in Islam)*: Dar al-Salam for prining and publishing; 1992.
36. Hens K, Nys H, Cassiman JJ, Dierickx K. The storage and use of biological tissue samples from minors for research: a focus group study. *Public health genomics*. 2011;14(2):68-76.

37. Pinxten W, Dierickx K, Nys H. Ethical principles and legal requirements for pediatric research in the EU: an analysis of the European normative and legal framework surrounding pediatric clinical trials. *European journal of pediatrics*. Oct 2009;168(10):1225-1234.
38. Kuwait Ministry of Awqāf and Islamic Affairs State of Kuwait. *Al-Mausoha Al-Feqhia (Juridical Encyclopedia)*. Vol 45. Kuwait: Ministry of Awqāf and Islamic Affairs State of Kuwait; 2006.
39. Shankeeti M. *Ahkam Al-Jeraha Al-tebia (The rules of medical surgery)*. Jeddah: Maktabet Al-Sahaba; 1994.
40. Hens K, Levesque E, Dierickx K. Children and biobanks: a review of the ethical and legal discussion. *Human genetics*. Sep 2011;130(3):403-413.
41. Pinxten W, Nys H, Dierickx K. Frontline ethical issues in pediatric clinical research: ethical and regulatory aspects of seven current bottlenecks in pediatric clinical research. *European journal of pediatrics*. Dec 2010;169(12):1541-1548.
42. Stultiëns L, Goffin T, Borry P, Dierickx K, Nys H. Minors and informed consent: a comparative approach. *European journal of health law*. 2007;14(1):21-46.
43. Jordanian civil law. 43/1976. Vol 431976.
44. Algerian civil law. 75-58. Vol 401975.
45. Tunisian Code of Obligations and Contracts. Vol 7/19562005.
46. Egyptian civil law. *Preliminary / Chapter II*. Vol 441948.

Chapter 3

Review of National Research Ethics Regulations and Guidelines in Middle Eastern Arab Countries

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ABSTRACT

Background: Research ethics guidelines are essential for conducting medical research. Recently, numerous attempts have been made to establish national clinical research documents in the countries of the Middle East. This article analyzes these documents. **Methods:** Thirteen Arab countries in the Middle East were explored for available laws, national codes, regulations, and guidelines concerning research ethics, and 10 documents from eight countries were found. We studied these documents, considering the ethical principles stated in the Declaration of Helsinki, the Council for International Organizations of Medical Sciences (CIOMS) guidelines, and the International Conference of Harmonization - Guidelines for Good Clinical Practice (ICH-GCP). Our paper comprises a complete list of protections, such as confidentiality, informed consent, ethics committees, and others. **Results:** This study found different levels and kinds of research ethics regulations and guidelines in the countries examined. Two groups can be distinguished: the countries in the first group have one or more research ethics regulations or guidelines, while the countries in the second group have not yet established any. Most of the documents showed various degrees of deficiencies in regard to ethical protection. The majority of the documents that were examined refer to one or more international documents on biomedical research ethics. **Conclusions:** Recently, a lot of efforts have been made in many countries in the Middle East. However, compared with international documents, most of the research ethics documents in use in this region demonstrate numerous deficiencies. As it relates to these documents, extensive differences could be observed in regard to development, structure, content, and reference to international guidelines.

BACKGROUND

In recent decades, there has been increased awareness of ethical issues because of the extensive expansion of clinical research and trials.^{1,2} There has also been growing debate over the ethical challenges faced by

different societies.^{3,4} Accordingly, scholars have begun to consider how to offer protection to the research community, resulting in the creation of research ethics guidelines in many countries¹. Interest

Ethical guidelines did not truly appear until after World War II. Prior to this point, efforts to regulate human experimentation—such as the codes of Thomas Percival in England (1794)—were few and exceptional¹. The code of William Beaumont, issued in 1833, is the oldest American document dealing with the ethics of human experimentation². In 1847, the American Medical Association (AMA) issued its code of ethics². However, the well-known Nuremberg Code, issued in 1947, was the actual beginning of established national ethical codes governing medical research.⁵ Many countries later issued their own memorandums about research ethics. Nuremberg was followed by the Declaration of Helsinki (adopted, 1964), established by the World Medical Association (WMA), which created international regulations governing many countries.⁶ Many other international guidelines were subsequently proposed by different organizations, including the International Ethical Guidelines for Biomedical Research Involving Human Subjects (1982; revised, 2002), prepared by the Council for International Organizations of Medical Sciences (CIOMS) and the World Health Organization WHO,⁷ and the Guidelines for Good Clinical Practice (GCP, 1995; revised, 2004), prepared by the ICH.⁸ However, there is a question about the appropriateness of the application of such international guidelines to regions across the globe, particularly including the Middle East. Because of differences in social and economic elements and the development of institutes in less developed countries, it is crucial to remember that these international guidelines were decided upon by professionals from developed countries.

Statistics between 2006 and 2010 show a 4 percent rise in the global number of drug trials conducted in the Middle East, which was the largest increase in any region of the world.⁹ Conversely, the number of drug trials in North America decreased by 11 percent in the same period.⁹ Many factors make the Middle East attractive for clinical research, including its patient diversity, good medical facilities, cost advantages, and favorable infrastructure, especially in the Gulf countries.⁹ In addition, recent medical advances and economic growth in many Arab countries have made educational improvement the focus of many governments; thus, many new universities and research centers have appeared, such as the King Saud bin Abdulaziz University for Health Sciences and the King Abdullah International Medical Research Center, which was established

in Saudi Arabia in 2005. Moreover, with countries in the Middle East operating under considerably fewer strict ethical guidelines than their European and North American counterparts,⁹ drug companies are increasingly moving trials of new and untested drugs to Arab countries.

As a result of this increase in clinical research in the Middle East, many ethical issues involving the use of human subjects in these countries have been brought to the attention of ethicists in the region.^{10-12,} In a study conducted among members of research ethics committees in Egypt, 92% of interviewees ranked the development of appropriate national guidelines as a major challenge.¹⁰ Moreover, there is a sense that governments and research communities are keen on developing good guidelines for clinical research.

In this paper, we reviewed the relevant guidelines, regulations, and ethical codes of the Arab countries in the Middle East; investigated whether each country had national regulations or guidelines on research ethics; determined whether ethical principles are stated in these guidelines and, if so, which ones; and then compared them with each other and with the major international guidelines.

METHODS

Data sources and study selection

Using direct access to the websites of various governmental agencies in each country, we conducted a review of the available online direct data sources for guidelines on research ethics and clinical research laws and the indirect data sources included in the codes of ethics. The websites of ministries of health, ministries of higher education, medical councils, the food and drug administrations, research centers, medical unions, and national committees of bioethics in the 13 member nations of the League of Arab States in the Middle East were searched.¹³ The countries studied were Kuwait, Qatar, Bahrain, Saudi Arabia, the UAE, Oman, Egypt, Syria, Lebanon, Palestine, Jordan, Iraq, and Yemen.

Our study selection included all national codes or guidelines (after confirmation by professional research ethics experts from each country) available online that addressed research ethics either exclusively or partially. We critically examined all these national codes and guidelines, considering the protections mentioned in the Declaration of Helsinki, the

CIOMS guidelines,⁷ and the ICH-GCP. Owing to their wide acceptance around the world, we selected the Declaration of Helsinki and the ICH-GCP for comparison. We selected the CIOMS guidelines for the same reason, but also because they were crafted specifically with the aim of applying the Declaration of Helsinki to developing countries in a way that reflects the conditions and needs of biomedical research in those countries, and due to the implications for the multinational or transnational research in which they may be partners.⁷ A list of the 19 ethical protections could be found in these international documents and considered a standard to be used in our comparison. (See table 2).

All relevant documents, written in either English or Arabic, were eligible for inclusion.

Data extraction and synthesis

Our study approach included both qualitative descriptions and comparisons of selected guidelines.¹⁴ First, guidelines from each country were examined for an explicit description of the type of regulations that existed and the entities that released them. We then noted the purpose of the guidelines and sought to ascertain whether the research ethics protections were determined exclusively by the guidelines.

RESULTS

We retrieved the 10 available guidelines from eight different countries. Three of the guidelines came from Saudi Arabia. No national guidelines could be found in the remaining five countries: Syria, Iraq, Palestine, Yemen, and Oman. (See table 2)

Historical overview

After the establishment of the first international and Western clinical research guidelines, it required a few decades for decision makers in the Arab countries in the Middle East to begin making about their own guidelines. The first attempts at crafting clinical research regulations appear as summarized chapters in the general medical ethics guidelines: in Lebanon, the “Law of Medical Ethics” (1994),¹⁵ in Saudi Arabia, the “Ethics of the Medical Profession” (1998; renewed, 2007) ¹⁶ and in Egypt, the “Profession Ethics Regulations” (2003).¹⁷

Table 1: Research ethics guidelines and laws found in the 13 countries in the Middle East

		Country	Entity	Year	Guidelines
1 st Group	A	UAE	Ministry of Health	2006	Guidance for conducting Clinical Trials Based on Drugs/Medical Products & Good Clinical Practice
		Qatar	Ministry of Health	2009	Guidelines, Regulations and Policies for Research Involving Human Subjects
		Bahrain	Ministry of Health	2009	Ethical Guidelines for Health Research
		Kuwait	Kuwait Institute for Medical Specialization (KIMS)	2009	Ethical Guidelines for Biomedical Research
		Saudi Arabia	Saudi Food and Drug Authority (SFDA)	2005/2008	I Clinical Trial Requirement Guidelines
			Saudi Council for Health Specialties	1998/2007	II Ethics of the Medical Professions
			Council of Ministries	2010	III Law of ethics of research on living creatures (and its bylaw 2011)
	B	Jordan	Prime Minister's Council	2001	Law of Clinical Studies. Provisional Law No. (67) for the Year 2001.
		Egypt	Ministry of Health & Population	2003	Profession Ethics Regulations No. (238) for the Year 2003.
		Lebanon	Perlman Council	1994	Law of Medical Ethics No. (288) for the Year 1994.
2 nd Group	C	Syria	Ministry of Health	-	Refers to Helsinki Declaration, International Ethical Guidelines for Biomedical Research Involving Human Subjects (CIOMS)
		Iraq	Ministry of Health	-	Refers to unknown Guidelines
	D	Oman	-	-	No document
		Palestine	-	-	No document
		Yemen	-	-	No document

The Jordanian “Law of Clinical Studies” (2001)¹⁸ was the first effort to regulate, as national law, how clinical research was conducted, and is the first document in the Arab countries to reference international guidelines and regulations such as the Declaration of Helsinki and the ICH-GCP.

Ten years after establishing universal ICH-GCP guidelines (1995), the first local GCPs began to appear in the region through the Saudi Food and Drug Authority’s (SFDA) “Clinical Trial Requirement Guidelines” (2005;

renewed, 2008)¹⁹ and the UAE's "Guidance for Conducting Clinical Trials Based on Drugs/Medical Products & Good Clinical Practice" (2006).²⁰

Kuwait's "Ethical Guidelines for Biomedical Research" (2009)²¹ and Qatar's "Guidelines, Regulations and Policies for Research Involving Human Subjects" (2009)²² are the first clinical research guidelines in these countries. The Saudi law, "Law of Ethics of Research on Living Creatures" (2010)²³ and its bylaw (2011)²⁴ is the most recent document listed and assumes that many regulations, guidelines, and laws are expected to appear in future years.

Description of the guidelines reviewed

Many differences exist in terms of whether countries in the Middle East have research ethics guidelines. We classified the countries into two main groups. The countries in the first major group already have guidelines and can be divided into two subgroups according to whether they have special national research ethics guidelines (A)—as is the case for Saudi Arabia, Qatar, Bahrain, Kuwait, the UAE, and Jordan—or whether they have general documents that contain some paragraphs about research ethics (B), as in Egypt and Lebanon.

The second major group contains countries that have no special guidelines but either refer to international guidelines, as in Syria^{25,26} and Iraq²⁷ (C), or no documents are found (D), as in Oman, Palestine, and Yemen.

Even though the guidelines used in Group A countries have similar names, their structures are not the same. All of them use the words 'guidelines' and 'research' or 'trials' in their titles. Additionally, the UAE's guideline adds 'good clinical practice' to its title ("Guidance for Conducting Clinical Trials Based on Drugs/Medical Products & Good Clinical Practice," 2006), which seems reasonable because the UAE's guideline uses the ICH-GCP structure and contains similar chapters, such as a glossary, principles, requirements for the approval of clinical trials, goals, medical institutes, protection of subjects participating in the clinical trial, and responsibilities of the investigator.

This GCP structure is also used by the SFDA guidelines (I in Table 1), which are called the "Clinical Trial Requirement Guidelines" (2005), without mentioning GCP in its title. The Kuwaiti guidelines, "the Ethical Guidelines

for Biomedical Research” (2001), contain only a small section that has been adapted from the ICH-GCP, specifically concerning the elements of informed consent.

The Bahraini (draft 2009)²⁸ and Qatari (2009) guidelines, in addition to the Jordanian “Law of Clinical Studies” (2001), do not use the ICH-GCP structure and diverge widely from each other. While the Bahraini guidelines and Jordanian law are summarized and abstracted, the Qatari document is detailed and has a comprehensive structure (Table 1).

Egypt and Lebanon do not have special guidelines; however, both countries have medical documents containing an abstracted chapter concerning clinical research.

Saudi Arabia is the only country that has three different documents referring to the regulation of research ethics. The first document (I) is a general guide and contains a chapter concerning biomedical research on both humans and animals, referring specifically to the main principles of clinical research. The second document (II) is issued by SFDA, while the third document (III) is an official legal document, stated by the council of ministers. The third document (Law of Research on Human Creatures) is followed by bylaw, which give explanations and details.

Of the 10 documents related to biomedical research ethics that were found, five are guidelines, three are national laws, and two are medical codes. Two of the three laws (Saudi Arabia and Jordan) focus on medical research, while the third (Lebanon) is a general medical law.

What ethical protections are mentioned?

Each guideline contains at least two or more protections. The Qatari guideline and Saudi law & bylaw contain the most protections at 19, followed by the Saudi “Clinical Trial Requirement Guidelines” with 15 protections. The Jordanian and Lebanese guidelines come at the end of the list, with only five; three, and two protections, respectively (see Table 2).

The obligation to obtain informed consent is the most frequent protection in the list of protections and represents the only item mentioned in all of the guidelines. Nine of the 10 guidelines examined mention an obligation of scientific validity and review by an ethics committee, while seven of 10 mention benefits, risks ratios, and confidentiality. Only five guidelines

discuss inducements to participate. Items related to incapacitation come next; thus five of 10 guidelines require limiting risks when dealing with incapable people, while only four discuss gaining their consent.

Table 2: Ethical protections stated in the research ethics document for the 13 countries in the Middle East

	Frequency of protections	Saudi Arabia			Kuwait	Qatar	UAE	Bahrain	Egypt	Lebanon	Jordan
		SFDA Clinical Trial Requirement Guidelines	Ethics of Medical Profession	Law of ethics of research on living subjects	Ethical Guidelines for Biomedical Research	Guidelines, Regulations and Policies for Research	Guidance for conducting Clinical Trials	Ethical Guidelines for Health Research	Professional Ethics Regulations	Law of Medical Ethics	Law of Clinical Studies
Informed consent	10	+	+	+	+	+	+	+	+	+	+
E. C.	9	+	+	+	+	+	+	+	+	-	+
Scientific validity	9	+	+	+	+	+	+	+	+	-	+
Confidentiality	7	+	-	+	-	+	+	+	+	+	-
Benefits and risks of participation	7	+	+	+	+	+	+	+	+	-	-
Limitations of risk of research on incapables	5	+	-	+	-	+	+	-	+	-	-
Inducement to participate	5	+	+	+	+	+	-	-	-	-	-
Consent of incapables	4	+	-	+	-	+	-	-	+	-	-
Research involving children	4	+	-	+	-	+	-	-	+	-	-
Ethical review of externally sponsored research	4	+	-	+	-	+	-	+	-	-	-
Information in the I. C.	4	+	-	+	+	+	-	-	-	-	-
Who is responsible for collecting I.C.	4	+	-	+	+	+	-	-	-	-	-
Research with limited resources	2	-	-	+	-	+	-	-	-	-	-
Research involving vulnerable persons	2	-	-	+	-	+	-	-	+	-	-
Compensation	3	+	-	+	-	+	-	-	-	-	-
Strengthening ethical and scientific capacity	3	+	-	+	-	+	-	-	-	-	-
Obligation to provide health-care	3	+	-	+	-	+	-	-	-	-	-
Women as research subjects	2	-	-	+	-	+	-	-	-	-	-
Equitable distribution of burdens and benefits	2	-	-	+	-	+	-	-	-	-	-
Total number of protections		15	5	19	7	19	6	6	9	2	3

I. C. = Informed consent, E. C. = Ethics committee

Four guidelines specifically mention special protections for research conducted on children. Four or fewer guidelines mention other specific

protections. Women and pregnant women are mentioned in only two of the guidelines.

What external resources are used as reference?

Eight of the guidelines and laws reviewed in our study refer to external resources. Five refer to international guidelines, while the other three claim to respect Islamic law. The Bahraini and Lebanese documents do not refer to any external references. The Declaration of Helsinki is used by five of the guidelines; the ICH-GCP by four, the Nuremberg Code and Belmont report by two, and the CIOMS is used only once. Even though Syria and Iraq do not have national guidelines, the Syrian Ministry of Health refers to the CIOMS guidelines and the ICH-GCP²⁶, while, on its website, the Iraqi Ministry of Health refers to guidelines extracted from an unknown reference, but mentions that no objection with the Islamic law can be accepted²⁷ (See Table 3).

Table 3: External references mentioned in the research ethics document for the 13 countries in the Middle East

	Saudi Arabia			Kuwait	Qatar	UAE	Bahrain	Egypt	Lebanon	Jordan	Syria	Iraq	Oman	Palestine	Yemen
	SFDA Clinical Trial Requirement Guidelines	Ethics of Medical Profession	Law of ethics of research on living subjects	Ethical Guidelines for Biomedical Research	Guidelines, Regulations and Policies for Research	Guidance for conducting Clinical Trials	Ethical Guidelines for Health Research	Professional Ethics Regulations	Law of Medical Ethics	Law of Clinical Studies					
Nuremberg code	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
Belmont report	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
Declaration of Helsinki	+	-	-	+	+	+	-	-	-	+	-	-	-	-	-
CIOMS Guidelines	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-
ICH-GCP	+	-	-	-	+	+	-	-	-	+	+	-	-	-	-
Others	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-
Islam	-	+	+	-	-	-	-	+	-	-	-	+	-	-	-

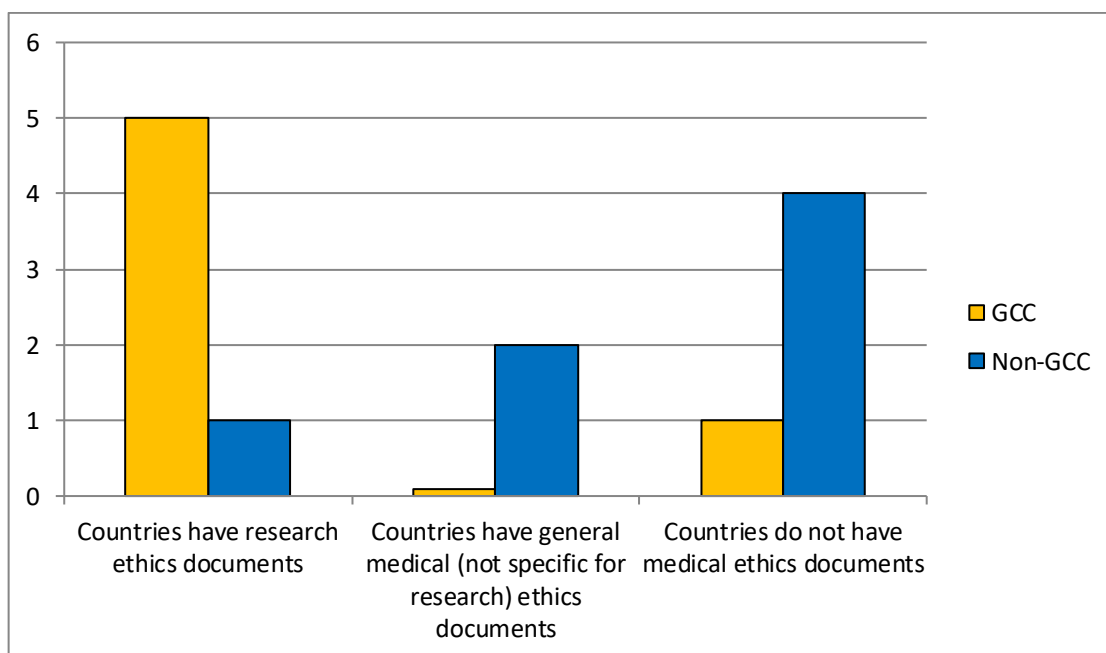
DISCUSSION

Economic power leads advances

Efforts have been made to regulate research ethics in some countries in the Middle East. These efforts can be seen in the new regulations that

contain all or most of the protections mentioned in the international guidelines related to research ethics, such as the ICH-GCP, the CIOMS guidelines,⁷ and the Declaration of Helsinki. Specifically, these efforts can be seen in the Qatari guidelines, Saudi law and the Saudi “Clinical Trial Requirement Guidelines” crafted by the SFDA, which contain the maximum number of protections. However, the Arab Middle Eastern countries were at different levels with regard to the development of research ethics guidelines; most of the GCC (The Cooperation Council for the Arab States of The Gulf which includes Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) made advanced steps in this regard compared with non-GCC countries (Figure 1).

Figure 1: Development of research ethics documents in GCC and non-GCC countries.



The dissimilarities between the countries could be interpreted as resulting from the distinct differences in the levels of financial support awarded to health care and research in GCC and non-GCC countries in the Middle East. Increasing economic power impacts the quality of life in GCC regions, especially in terms of medical services and therapeutic manufacturing and, consequently, also affects medical research and research ethics development (See figure 1). This is clear when we compare health care expenditure per capita. According to statistics from 2006, expenditure was \$538 in Bahrain, \$379 in Saudi Arabia, \$628 in Kuwait, \$716 in the UAE, and \$2,151 in Qatar, yet only \$103 in Jordan and

\$38 in Egypt.⁹ Expenditure on health in GCC countries enhances the Middle Eastern market for pharmaceuticals. BioPlan Associates (A leading company of source for scientific information through industry-leading surveys, reports and publications) expect the health market in the GCC to be worth approximately \$15 billion by 2014.⁹

Wide variation and major deficiencies

Compared to international guidelines, such as the ICH-GCP and CIOMS,^{7,8} all of the national guidelines described here have many deficiencies in their stated protections, which differ in type and number from one country to another. This variation could be interpreted as a sign of the degree of development of these guidelines, or as a sign of the level of importance associated with each protection on the other.

These deficiencies will have an effect on clinical research—especially experimental trials—in the region. Fewer protections mean less strict guidelines, which, in addition to good medical facilities and a suitable research environment, will prove attractive to many pharmaceutical companies who may wish to transfer their research activities to such a region.⁹ The many deficiencies observed in these guidelines will leave a question mark as to their adequacy in offering the necessary protections to research subjects in the region.

Scientific validity and obligations for informed consent and review by an ethics committee were mentioned in 10, and nine of the 10 reviewed guidelines, respectively. This indicated the importance of these protections as well as the awareness of the principle of autonomy and freedom in making decisions to participate in clinical research and taking care to carefully review research proposals and concrete ethical guidelines. Confidentiality and the balance of benefits and risks are also important, as they are mentioned seven times. Additionally, even though there is consensus on the guidelines regarding the obligation to have informed consent, only three guidelines described who is responsible for obtaining consent or explained the elements required, which is considered a great deficiency because simply having consent without its elements will invalidate this consent. In the region, there have been few studies about the adequacy of informed consent in medical research; however, this has not yet been reflected in the national document.^{29,30}

Another clear deficiency in the majority of these guidelines is the failure to reflect on the special societal requirements that result from ignoring vulnerable groups. Only two of the guidelines discussed vulnerable groups, two spoke of individuals with limited resources, four about children, one about women, and one about pregnant women. In fact, it is not only strange, but also a significant deficiency that children were mentioned in only four of the 10 guidelines because the nations in the Middle East are young and children represent a significant portion of their populations. For example, according to statistics from 2007, 32.5% of people in Saudi Arabia are 15 years old or younger.³¹ Thus, regulating the participation of children in clinical research and offering them sufficient protections are vital requirements for conducting research in the Middle East.

Despite their importance, providing compensation to research subjects and the equitable distribution of burdens and benefits are rarely among the listed protections. This reflects insensitivity toward these concerns and demonstrates a weakness in the experience and awareness of the results of clinical research. On the other hand, it is, to some extent, understandable that research on populations and communities with limited resources were mentioned in only two guidelines, as the current guidelines that appear in the GCC countries do not really lack resources.

Are international research ethics guidelines a proper measure for the assessment of research ethics documents in Middle Eastern Arab countries?

The majority of the published and discussed documents refer to one or more international documents on biomedical research ethics, such as the Declaration of Helsinki, ICH-GCP, and others. This also applies to Syria and Iraq, where, until now, no such national documents have been available; however, both countries have referred to one or more of the research ethics international documents on their Ministry of Health websites. Different social, religious and cultural factors raise the question of the appropriateness of using international documents as a standard-bearer for national documents on biomedical research ethics in Middle Eastern countries.

The principles stated in these international documents are undoubtedly universal and reflect shared values. However, in many regions worldwide values derived from religion and culture share in formulating bioethics,

including research ethics. It is, consequently, important for national documents to reflect international values as well as the values of their societies. The CIOMS guidelines have significant importance in this regard because they were formulated to be applicable to developing countries.⁷ The Islamic reading of this document, as seen by some Muslim scholars assigned by the Islamic Organization of Medical Sciences IOMS, is that the ethical principles of the CIOMS guidelines were fully compatible with Islamic law.³² Consequently, the CIOMS guidelines can be considered valid for use in the Middle Eastern countries where the majority of the population is Muslim.

Surprisingly, only three documents of the ten studied—two from Saudi Arabia and one from Egypt—discuss respect for Islamic perspectives. Additionally, these references are merely general statements about respecting Islamic values. None of the guidelines refers to the documents and regulations released by Islamic medical entities such as the IOMS.³² This can be interpreted in two ways: either the authors of research ethics documents in the Middle Eastern countries see no contradiction between biomedical research ethics and Islam or, alternatively, there is no relation at all between the two and, therefore, no need to refer to Islam in any national document about biomedical research ethics. Moreover, none of the documents mentions any related fatwa, which indicates that fatwas are not well known or are not seen as important by national guideline makers.³³

However, theoretical agreement between ethical principles and cultural/religious values is insufficient. The interpretation and application of ethical principles may differ from one society to another. This is not limited to the situation in the Middle East, but also to other areas in the developing world, such as Africa.³⁴ Issues such as research on women, informed consent, and breaches of confidentiality require more attention in the guidelines and applications of research in the Middle East.^{29,33}

LIMITATIONS

While the information in this study is based on the most recent data available, three restrictions on the data should be noted. First, analysis of and comparison between the contents of the guidelines among national documents and international documents—such as defining minors, incompetent persons, benefits, risks, and so forth—cannot be performed in a scientific manner because these guidelines are designed to provide

concise and general ethical protections. Thus, there is no ability to estimate or analyze the meanings and dimensions behind the stated protections. Meaning is expected to be detailed in the manuals of the policies and procedures for research ethics guidelines, similar to the newly published “Saudi Bylaw of ethics of research on the living creatures” (2011), which is the only manual related to research ethics available in the region.²⁴

Second, we do not include the ongoing efforts to establish guidelines in many countries, such as in Egypt, Jordan and Saudi Arabia, where it is expected that new guidelines will appear in the coming years.

Third, our paper does not report information on the process of ethical review at the national level or on what mechanisms are used to encourage adherence to regulations or guidelines.

CONCLUSIONS

Recently, notable efforts to establish national research ethics guidelines have been made in many countries in the Middle East. However, compared with international documents, most of the research ethics documents in use in this region demonstrate numerous deficiencies. Many differences among the documents can be observed in the development, structure, content, and reference to international guidelines. Guidelines from GCC countries are more developed compared with guidelines from other countries in the Middle East. Greater efforts are required to develop better regulations and guidelines in most countries in the Middle East.

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REFERENCES

1. Fluss SS. The evolution of research ethics: the current international configuration. *J Law Med Ethics*. Winter 2004;32(4):596-603.

2. Seto B. History of medical ethics and perspectives on disparities in minority recruitment and involvement in health research. *Am J Med Sci.* Nov 2001;322(5):248-252.
3. Kass, N. E., Hyder, A. A., Ajuwon, A., Appiah-Poku, J., Barsdorf, N., Elsayed, D. E., ... & Tindana, P. (2007). The structure and function of research ethics committees in Africa: a case study. *PLoS Medicine*, 4(1), e3.
4. Benatar, S. R. (2002). Reflections and recommendations on research ethics in developing countries. *Social science & medicine*, 54(7), 1131-1141.
5. Nuremberg Code. <http://ohsr.od.nih.gov/guidelines/nuremberg.html>; 1947. <http://ohsr.od.nih.gov/guidelines/nuremberg.html>. Accessed 28 July 2012.
6. World Medical Association (WMA). Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA: the journal of the American Medical Association*. 2013;310(20):2191.
7. Council for International Organizations of Medical Sciences (CIOMS), WHO. International ethical guidelines for biomedical research involving human subjects. In: Sciences CIOM, Organization WH, eds. Geneva: CIOMS; 2002.
8. International Confernece of Harmonization. Guidelines for Good Clinical Practice GCP. <http://www.ich.org/products/guidelines/efficacy/article/efficacy-guidelines.html>. 2004.
9. Kermani F. How to run clinical trials in the Middle East. *SCRIP*. 2010:1-8.
10. Sleem H, El-Kamary SS, Silverman HJ. Identifying structures, processes, resources and needs of research ethics committees in Egypt. *BMC medical ethics*. 2010;11:12.
11. El-Dessouky HF, Abdel-Aziz AM, Ibrahim C, Moni M, Abul Fadl R, Silverman H. Knowledge, awareness, and attitudes about research ethics among dental faculty in the Middle East: A pilot study. *International journal of dentistry*. 2011;2011.
12. Kandeel N, El-Nemer A, Ali NM, et al. A multicenter study of the awareness and attitudes of Egyptian faculty towards research ethics: A pilot study. *Journal of Empirical Research on Human Research Ethics: An International Journal*. 2011;6(4):99-108.
13. League Arab States. <http://www.arableagueonline.org/>.
14. Sandelowski M. Whatever happened to qualitative description? *Res Nurs Health*. Aug 2000;23(4):334-340.
15. Lebanon, Presidential Law. *Law of Medical Ethics (قانون الآداب الطبية)*. No. 288 for the year 1994. Beirut; 1994.
16. Ethics of Medical Profession (أخلاقيات المهن الطبية). In: Specialties SCfH, ed2007.
17. Saudi Commission for Health Specialties. *Profession Ethics Regulations*. The Resolution of the Minister of Health & Population No. 238/2003. Riyadh; 2003.
18. Jordan. Prime Minster's Council. *Law of Clinical Studies, Provisional Law No. (97) For the Year 2001*. Amman; 2001.
19. [Saudi Food & Drug Authority](#). *Clinical Trial Requirement Guidelines*. Riyadh; 2009.
20. UAE. Ministry Of Health. *Guidance for conducting Clinical Trials Based on Drugs/ Medical Products & Good Clinical Practice*. UAE; 2006.

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PART II: Empirical Research

Chapter 4

Confidentiality, Informed Consent, and Children Participation in Research Involving Stored Tissue Samples: Interviews with Professionals from the Middle East

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ABSTRACT

The ethical issues regarding research biobanks continue to be a topic of intense debate, especially with respect to issues of confidentiality, informed consent, and child participation. Although considerable empirical literature concerning research biobank ethics exists, very little information is available regarding the opinions of professionals from the Middle East on this subject. To close this gap, we conducted 12 interviews with professionals from the Middle East to document their opinions. We found few differences between those interviewed; their primary concerns were mainly similar to what is stated internationally; they generally believed that confidentiality protection is socially very important and that informed consent must be obtained from both adult and child participants. In addition, because most populations have a high percentage of children, and because children are not just small adults, but they show important differences, the interviewed professionals strongly believed that it is imperative to include children in biobank research.

Keywords: confidentiality; children; informed consent; developing countries; ethics; genetics; Middle East

INTRODUCTION

An increasing number of medical studies are focusing on the genetics and the environment. Understanding inherited diseases is important in order to find new treatments. The Framingham Heart Study, <http://www.framinghamheartstudy.org/>, Monitoring of Cardiovascular Diseases (MONICA) <http://www.ktl.fi/monica/>, and Prospective Cardiovascular Münster Study (PROCAM), <http://ear001.uni-muenster.de/index.html>, represent several examples of longitudinal studies that have used collected stored materials and have considerably

influenced our understanding of the pathogenesis of several diseases, including infarction and angina.

Considerable discussion currently exists regarding biobanks and the use of stored tissue samples in genetic research. In particular, these discussions focus on the ethical, legal, and social aspects, such as issues of the ownership of the samples, data, return of research results back to participants, privacy and confidentiality; and the procedural aspects related to issues of storage, information, and research projects.¹ The biobank debates range from issues relating to research approvals, storage, and archiving of samples to those concerning the problems of sharing data with other biobanks including private biobanks, the responsibilities of the biobanks, and conflicts of interest among institutions.² Considerable discussion is centered around issues such as confidentiality and privacy,³ the best scientific basis for genetic research, commercial use of the information including the possibility of sale, intellectual property issues,⁴ and benefit to society.⁵ Moreover, the issue of obtaining approval to participate in research has received significant attention,^{6,7} especially discussions regarding one-time consent as well as the right of the patient to withdraw consent and the degrees of this withdrawal.⁷⁻⁹

The participation of children in biobank studies poses unique ethical challenges in contrast to the participation of adults.^{10,11} In particular, debates focus on the necessity of child participation, minimizing risk, the right of either parent or a single parent to sign on behalf of the child, the extent of this consent, the right of the child to provide participation consent, and so forth.

Recently, some discussions and scientific events concerning ethical issues relating to sample storage and biobanks have occurred in Saudi Arabia one of the Middle Eastern countries, because of the implementation of the first national biobank in that region. For example, workshops on gene ownership (King Abdul Aziz City of Science and Technology KACST 2003), ethics of biobanks (King Abdullah International Medical Research Center KAIMRC 2010), and tissue banks leadership (College of Medicine at the King Saud University 2011) were conducted in Saudi Arabia.

Researchers in the Middle East are influenced by many social and cultural factors in contrast to the environment in the west where a lot of

professionals educated there. This mixture of many factors pushes us to study their thoughts about some ethical concerns in clinical research.

Despite numerous debates and publishing on biobanks in Western countries, we could not find any published empirical work regarding the opinions of clinicians and researchers working with stored tissue samples in the Middle East. Examples of such studies in other countries include, Ruiz et al. who compared researchers from Spain and the USA¹² and Ries et al., who interviewed investigators of six studies to determine how these studies handled different ethical, legal, and social issues.¹³ Meulenkamp interviewed researchers about the communication of the results of biobank research.¹⁴ Several researchers have focused on examining the ethics of stored samples collected from children.^{11,15-17}

Very few empirical studies in the Middle East concern research ethics in research on stored samples could be found. Abou-Zeid A, et al. obtained the viewpoints of patients regarding stored samples for future research. This study showed that many participants do not favour sample donation for future research, and prefer restricting the future research to the illness being. Moreover, many participants were hesitant to have their blood samples donated for genetic research or exported out of the country.¹⁸ Another study was general and not focused on the ethics of stored samples in particular conducted by El-Dessouky et al, who performed a pilot study to assess the knowledge, awareness, and attitude of research ethics among dental faculty. This article showed that there is a knowledge gaps in research ethics and there is broad-based acceptance of IRBs and training in research ethics.¹⁹

The concepts that professionals in the Middle East consider ethically concrete and the common practices in stored sample research in this area remain largely unexplored. What is the position of professionals in the Middle East regarding the ethical challenges in research biobanking? How they think? What are their concerns? We considered it important to interview such professionals with the aim of understanding their thoughts and opinions on the main ethical issues involved in the storage and usage of tissue samples in research. Our study presents the main findings of these interviews.

METHODOLOGY

Because there is a paucity of information regarding the opinions of professionals from the Middle East on clinical research in general and on genetic research in particular, we conducted in-depth interviews with professionals from the Middle East involved in medical and genetic research (including research biobanks). In this qualitative method of analysis, we identified and focused on themes of importance, after conducting three interviews with three professional from different backgrounds. None of these three interviews were included in our study. This is a preliminary study of the ethical issues in biobank research, and we believe our results could provide a starting point for additional quantitative studies in the form of surveys. We used the snowballing technique to select our interviewees, resulting in 11 interviews from experts in the Middle East plus 1 interview with a biobank expert from Sudan, which can be included in the Middle East in a wider definition. Even there are many definitions of the Middle East region; we were interested only in professionals from Arab countries in this region, because they represent much similarity among each other especially regarding language, history, culture, and religions.

Table 1 Interviewee Characteristics

Profession of Interviewees	Epidemiologist	5
	Internist	2
	Pediatrician	1
	Surgeon	1
	Pathologist	1
	Forensic	1
	Microbiologist	1
Gender of interviewees	Male	8
	Female	4
Location of interviewees	Saudi Arabia	4
	Jordan	2
	Syria	2
	Egypt	2
	Sudan	1
	Lebanon	1
Places of interviewees' medical / scientific training	Middle East only	1
	Middle East and Europe or US	11
Type of collection	Collected for research purpose (only)	3
	Collected for diagnostic purpose, but can be used in research later	6
	Collected primarily for both for diagnostic and research purposes	3
Type of interview	Live	12

We considered the geography and specialty diversity to the extent possible and obtained a final pool of interviewees from six countries and seven specialties, which are indicated in Table 1. Although the

interviewees' profiles and specialties varied (Table 1), all of them are or were working with stored samples.

We initially contacted all 12 interviewees via email, and subsequently, we scheduled face-to-face interviews. All interviewees have been selected on basis of having experience and work on research on stored human samples, in different Arabic countries in the Middle East. We conducted these interviews during April and July 2012. The duration of each interview ranged between 40 and 75 minutes. We conducted the interviews in English or Arabic.

Our interviews focused on the three themes of confidentiality, informed consent, and child participation. We used a semi-structured approach for our interviews rather than a structured one to enable us to include important remarks and findings throughout the interviews.²⁰ GA was the interviewer for all 12 interviews. Interview guide were prepared together by GA and KD.

After we recorded our interviews, we transcribed the audio records without performing any language corrections to retain the oral nature of the speech of our interviews.²¹ We manually coded the texts of the 12 interviews, and classified the responses into an introductory theme and the three main themes that were focused on in the interviews. Subsequently, we made sub-themes of the four themes. Illustrative quotes were selected to reflect the meanings of the themes and sub-themes. We have indicated the professions of the interviewees with their quotes, and translated them into English, wherever necessary. To protect confidentiality the word "interviewee" is used to refer to any of our interviewees.

RESULTS

Research ethics guidelines

Regarding clinical research ethics guidelines in general, many interviewees felt the need for more national or institutional guidelines, such as that in developed countries, like US and Europe. Two interviewees felt that there was no requirement for more guidelines, citing the fact that most countries rely on international guidelines, such as the Declaration of Helsinki, Council for International Organizations of Medical Sciences (CIOMS) guidelines,³³ or Guidelines for Good Clinical Practice (ICH-GCP),

or have derived their own guidelines from international guidelines. However, all interviewees agreed that research ethics training is necessary. One of the interviewees said,

"The issue is not related to guidelines, but it is a matter of education. We already adapt and use Western and international guidelines."
(Epidemiologist 1)

This professional clearly alluded to the main points that were quoted by other interviewees. All the interviewees felt that research professionals in the Middle East need training to increase their awareness of clinical research and to eliminate any potential misunderstandings.

The lack of guidelines and training is not unique to clinical research and this issue was also brought up during the discussion on genetic research or research on stored samples and biobanks. It is necessary to provide more training to researchers, particularly because of the increased importance of confidentiality. All the interviewees conceded that there is a major lack of regulations and guidelines in both national and institutional standards.

Table 2 Overview of the themes and findings

Themes	Findings
Research ethics regulations & ethical challenges	Better national & institutional guidelines concerning research on stored tissue samples are required
	No different ethical changes in the Middle East or in Muslim countries
	Social values must be respected
	Islamic rules can form a basis to control ethical challenges related to clinical research and research on stored samples
Confidentiality	Confidentiality is a major concern
	The nature of genetic information is familial
	Breaching confidentiality may have serious consequences
	Stigma is a real fear
Informed consent	Sending samples abroad must be minimized
	Informed consent is mandatory
	Both women and men have the right to sign the consent form
	The process of obtaining informed consent is inadequate
	Broad consent is preferred
	Participants have a right to withdrawal of consent at any time
Child participation	Degrees of withdrawal
	Clinical research is important, particularly in the Middle East
	Children need more protection
	Exposure to not more than minimum risk
	Fathers are given priority to give consent for their children
	Child assent is important

When comparing international and institutional guidelines, the majority of interviewees stated that national guidelines and regulations are more important and they should be applied in all medical research institutes in the country, because this would facilitate collaborative research among many centers, and the enable better control over them.

According to the interviewees, confidentiality, informed consent, and avoiding harm to research participants are among the most important ethical research concerns on stored samples. The interviewees did not observe any differences specific to the Middle East, where the majority of people are Muslims. In other words, Islam does not create specific ethical challenges for clinical or genetic research. This is well illustrated by the following quote from a professional who has worked in both Western and Middle Eastern countries:

"There might be religious and cultural impacts on genetic research and biobanks of which I am not aware, and one must be careful. Islam eventually does not negatively affect clinical research. It is not an issue of Islam; this impact comes from misunderstanding. This is not limited to Muslims, but is a phenomenon that I observed among Christians as well. It is an issue of social habits and customs." (Internist 1)

One interviewee stated that rules derived from Islamic principles can manage all ethical challenges that clinical research, genetic research, or research biobanking might face.

"Islam has its ethical principles but also its flexibility. Nonetheless, we do not follow these ethical principles." (Pediatrician)

Notably, one interviewee recalled a certain fatwa* about research, whereas three other interviewees reported that they had heard of such a fatwa, but were unsure of its existence. The remaining eight interviewees were unaware of any related fatwa, but they thought that having such a special fatwa would be effective for supporting the existing guidelines and encouraging people to participate in genetic research or research biobanks.

Confidentiality

* In Islam, a fatwa is a juristic ruling concerning Islamic law issued by an Islamic scholar.

All the interviewees indicated that respecting privacy and confidentiality are extremely important ethical principles of clinical research. An interviewee said:

"All doctors must consider and deal with medical information as secret between doctors and their patient. This is important as well between researchers and research subjects." (Internist 1)

Privacy and confidentiality are even more important in genetic research because the information collected from patients pertains not only to those individuals but also to their families and, according to four of interviewees from Saudi Arabia and Jordan, to their tribes.

According to a majority of the interviewees, confidentiality is a major concern of research participants. They believed that the fear of breaches of confidentiality might prevent people from participating in clinical research and genetic research. One interviewee said,

"I think assuring people that no breaches of confidentiality exist in a certain research area will encourage them to participate much more." (Epidemiologist 2)

However, another interviewee believed that the fear of breaches of confidentiality does not deter people from participating in clinical research, as expressed in following quote,

"People are accustomed to having extensive and deep social relationships. The difficulty comes only from not having the habit of participating or donating. In general, they are not fully aware of the importance of confidentiality itself." (Internist 2)

Stigma and discrimination are genuine fears that negatively impact societies in the Middle East and can extend from the research participant to other family members. Such discrimination will not only have effects on employment opportunities or obtaining insurance, but might assume different forms. One interviewee stated,

"Stigma and discrimination are very strong in our society. If one was known to be HIV-positive or to have failed a paternity test, his sisters and possibly his brothers would face difficulties getting married." (Epidemiologist 1)

In general, most interviewees believed that additional procedures and regulations are required for protecting genetic information. However, in some cases, breaches of clinical information could be as serious as those of genetic information. This was clearly stated by one interviewee,

"Information in clinical research and information in genetic research are the same; they can be routine or sensitive information." (Epidemiologist 2)

According to all the interviewees, transferring any genetic information from any research participant to a third party, should be strictly prohibited. This prohibition against transfer of genetic information is also applicable to research institutes or genetic centers. Without a court order, even police officers have no right to obtain genetic information. All interviewees expressed caution with respect to sending samples or data to other countries, even for a better diagnosis. One interviewee said,

"Sending samples outside the country must be minimized to very necessary cases, unlike what was done a few years ago." (Epidemiologist 3)

Another interviewee expressed concern that despite legal restrictions, some doctors and researchers intend to send samples to other countries illegally, whereas other researchers do so out of ignorance for such legal restrictions.

Therefore, the challenges related to sending samples abroad include unethical or illegal use of samples and confidentiality issues.

Informed consent

All interviewees clearly stated that obtaining a signed voluntary informed consent from research participants is mandatory for conducting any clinical research. Written consent must be obtained, especially for research on stored tissue materials. These conditions apply to both men and women. None of interviewees accept any difference between men and women regarding giving informed consent for research on stored samples. An interviewee commented,

"Adult women must also sign the informed consent. It is neither acceptable, nor ethical to only obtain the signature of her father or husband. Otherwise, we would violate the woman's dignity." (Internist 1)

This comment reflects the unanimous opinion of all interviewees. However, one interviewee added,

"Ethically, when a pregnant woman wants to participate in research, informed consent must be collected from both the woman and her husband." (Epidemiologist 4)

All the interviewees confirmed that obtaining an informed consent from all research participants is a part of the usual practice in genetic research in all research centers. The interviewees also agreed that each of the following elements must be included in the consent form: research descriptions, risks, benefits, alternatives, confidentiality, compensation, contacts of the researcher, and voluntary participation. The interviewees consider these elements essential, and none of these elements must be eliminated.

However, the main challenge regarding informed consent arises from the manner in which it is obtained. According to the interviewees, the process followed for collecting informed consent does not always guarantee that research subjects are provided with all information they will need to know before giving their informed consents. This is elucidated in a quote from one of the interviewees, who described the process that her institute follows for obtaining informed consent:

"Usually, a nurse will bring many pages of informed consent and ask a potential participant whether he/she agrees to participate in research that will be performed by a doctor. If yes, the nurse will ask him/her to sign at the bottom on the informed consent without reading a single sentence in the informed consent. This process takes just a few seconds. This is not true informed consent." (Internist 1)

The interviewees in this study think that one-time consent (collecting only one informed consent for unlimited number of research) is better when dealing with stored samples research and biobanks. However, they insist that all the participants have a right to withdraw their consent in both biobanks and all other types of research. Nonetheless, in some research studies, complete withdrawal cannot be permitted, as explained by one of the interviewees,

"Many studies cost a lot, and sometimes, we need to buy special equipment, and if we allow complete withdrawal, we might lose a lot on

money. This is also the case when the research is studying rare diseases. We might allow only partial withdrawal and continue using stored samples by making the data fully anonymized." (Epidemiologist 4)

Many interviewees agree with the concept of partial withdrawal; however, they insist that if complete withdrawal is permitted, participants must be informed and their consent must be obtained.

This is illustrated by the following quote,

"Many biobanks around the world, like the UK biobank, allow different degrees of withdrawal. We have to do the same." (Epidemiologist 2)

Another interviewee stated,

"Biobanks are expensive and require significant effort and personnel, and we expect great benefits from the research on biobanks, so we have to find a solution. This can happen by allowing different degrees of withdrawal. We can stop collecting new data or samples, but we continue use parts of samples and data after doing full anonymisation so confidentiality is guaranteed." (Epidemiologist 4)

Child participation

All our interviewees believed that conducting research on children is essential. They agreed that using adult medications on children by only adjusting doses is neither scientific nor appropriate, as the physiology of children is different from that of adults. One interviewee said,

"Doing research on children is very important; even more so, not doing research on children is bad and harmful." (Pediatrician)

Some interviewees referred to the differences between the proportion of children to the total population of Middle Eastern countries and Western countries. The interviewees assumed that a higher percentage of children in Middle Eastern countries emphasized the need to conduct research on children in these countries.

Although necessary, interviewees indicated that it is difficult to attract children to participate in genetic research, and mentioned the need for effective educational programs to encourage people to permit their

healthy children to participate in research. Therefore, some efforts need to be made to convince parents to enroll their children in research.

Most interviewees perceived no differences in the risks associated with the research information collected for adults and children. Nevertheless, they believed that children due to children vulnerability need more protection and the information obtained from them should be addressed with greater care. One interviewee said,

"Children are vulnerable; we have to offer more protection to them. They cannot decide by themselves; we must help them and protect them. A needle prick is a major harm for children, so they need more protection" (Epidemiologist 3).

All the interviewees preferred that both parents jointly decide whether to enroll their children in clinical research and research biobanks or not; however, they indicated that the father is the final decision maker in case the parents' decisions differ. When we introduce a question about the mother-only consent for a child's participation in research the majority of the interviewees said that a mother cannot take a decision independently if the father is unavailable, unless the father's designee also agrees with the mother's decision. One interviewee dissented with this opinion and said that the mother can take an independent decision when the father is absent. This interviewee said,

"A mother knows her children very well and makes decisions in their best interest of them. Thus, there is no reason not to allow her to decide alone." (Epidemiologist 3)

All interviewees agreed that it was important to obtain assent from the participating children, wherever this was possible. Moreover, they considered obtaining the consent of the parents necessary and not wasteful. On asking the interviewees from what age onwards should assent be obtained from children, we received different answers: some said 10 years and above, some said 12 years and above, and others said 7 years and above. Moreover, some interviewees said that consent is not related to age, but to the ability to understand that the consent is for research purposes and to understand the informed consent. Using easy language and obtaining parent's help plays a vital role in the success of encouraging children to accept participation in research.

DISCUSSION

Need for establishing guidelines and providing training

We interviewed 12 professionals from the Middle East, who were working in the field of stored tissue samples, on the topic of principles of research ethics.

Most of the interviewees indicated that there is a need for more guidelines concerning research ethics in their countries. This is understandable because many guidelines in several countries are deficient and thus far, many Middle Eastern Arabic countries do not even have guidelines concerning research ethics.^{19,22} Despite the recently published guideline²³, which contains most ethical principles for research, interviewees from Saudi Arabia also agreed to the need for more guidelines regarding research ethics. This can be explained by the lack of awareness of these guidelines, moreover it is supported by other studies in other countries where there are no national guidelines till now.²² Two other interviewees agreed on the need for new guidelines, which is understandable given that many of the interviewees explained that their countries rely on international documents such as the Declaration of Helsinki, ICH-GCP, COMS guidelines, so forth.²²

The consensus of our interviewees regarding the lack of guidelines concerning genetic research in the Middle East is in line with our previous finding that thus far, no published guidelines on genetic research ethics are available in the region.²²

All our interviewees emphasized the importance of training in the understanding and application of ethics principles in their research. The lack of training in research has been addressed in several studies performed in the Middle East,^{19,24,25} and in some developing countries from other regions.^{26,27}

An Islamic opinion about any matter, especially recent matters is called a fatwa. Fatwas are usually issued by a scholar (called then an individual fatwa) or by a juristic council (called a plural fatwa). Plural fatwas are stronger than an individual one, and have an increasing interest.^{28,29} There two main groups of Muslims: Sunni 87-90% of total number of Muslims, and Shia 10-13%.³⁰ Fatwas, especially in the Sunni school, are usually not binding and do not have power to influence laws of Muslim States.³¹ Some

fatwas regarding clinical or genetic research have been issued by Islamic institutions, such as fatwas by International Islamic Fiqh Academy, a part of the Organization of Islamic Cooperation, like fatwa No. 161 regarding the Islamic perspectives on medical and biological research on human subjects,³² fatwa No. 67 concerning medical treatment,³³ fatwa No. 79 concerning confidentiality in the medical professions,³⁴ and fatwas 1/15 and 3/17 on genetic and stem cell research respectively by the Islamic Fiqh Council in the Muslim World League.^{35,36} Only one interviewee could define a certain fatwa. Three possible explanations for this are as follows: (1) the number of these fatwas is very limited, (2) the factual effect of these fatwas is very limited, and (3) they fail to reach doctors and researchers, especially because of the insufficient power that these institutions have in implementing these fatwas in Islamic countries.²²

Nonetheless, the interviewees believed that Islam and Islamic rules could form the basis for good ethical practice in clinical research. This can be understood in the context of the emphasis on trust in general Islamic ethics, such as honesty, respecting secrets, avoiding causing harm intentionally, respecting people, so forth. However, there is another issue that cannot be disregarded, which is related to the fatwas themselves for clinical or genetic research, because of the limited number of fatwas and their non binding power.

Confidentiality, more concerns, and more fears

Our interviewees seemed to implicitly acknowledge that confidentiality is an important principle in clinical research and genetic research. The interviewees' opinions matched perfectly with the ethical principles expressed in international documents, such as the Declaration of Helsinki, ICH-GCP, COMS guidelines, and Universal Declaration on the Human Genome and Human Rights.³⁷ Moreover, our interviewees emphasized the concept of confidentiality as an important principle in biobanks, and this is in line with many other studies³⁸⁻⁴⁰.

Interfamilial marriages result in genetic information shared by numerous people. Our interviewees indicated that family members, including extended family members, share similar genetic profiles. Similar studies mentioned to such opinion by interviewees as the study by Hens *et. al*¹¹. Moreover, in some countries in the Middle-East such as Saudi Arabia, the tribal system is a powerful social network with pragmatic impact on people's lives, including their matrimonial decisions. Marrying relatives is

often favoured and the tribes have thus, to some degree, cognate genes. Breaches of individual confidentiality might lead not only to individual stigma but also to familial and tribal stigmas.⁴¹ The family system in Muslim communities is built on specific selection criteria, such as degree of religiosity, beauty, wealth and family name. Marriage decisions in these groups most often are not individual decisions, but familial ones; thus, the family image and such stigmas can play a role in marriage decisions. Consanguinity and its social stakes, rationale and impact have been noticed as well in non-Middle Eastern Muslim communities such as Pakistani immigrant in the UK.^{42,43} The interviewees' concern regarding extended stigmas is supported by other studies, especially with regard to the high rate of consanguinity and genetically inherited diseases in Middle East countries such as Saudi Arabia.⁴⁴

Our interviewees show some concern regarding sending human tissues and data to developed countries for diagnostic and research purposes, because a study of these tissues can reveal very sensitive information. The practice of sending tissues overseas was common in different countries in the Middle East. The concern of researchers and our interviewees with sending samples outside the country stem from the fear that these samples will be misused. This concern of researchers has led many countries to establish laws for regulating the transfer of such research samples and materials outside the country, thereby limiting such transfer to very essential cases, such as Saudi Arabia (National Committee of Bio-Medical Ethics).²³

Informed consent

Although our interviewees agreed that informed consent in clinical and genetic research is mandatory, they expressed significant dissatisfaction with the process used for obtaining informed consent. This is in line with results of studies conducted in different areas.^{7,45,46}

Our interviewees were concerned with the following two points: the minimal experiences of staff who obtain informed consent and the limited time given to participants to sign their consent. Deschenes *et al.* (2011) analyzed informed consent document utilization in a minimal-risk genetic study and concluded that few research participants thoroughly read the consent document before agreeing to participate in the genetic study.⁴⁷ The interviewees preferred obtaining one-time consent from research

participants for practical reasons; this opinion corresponded with the findings of many authors of ethics studies of biobanks.^{11,48}

According to interviewees, both women and men have the right to sign alone consent for participating in clinical research. However, there are some limitations. Some interviewees argued that social values have to be considered, and it is preferable to approach both the husband and the wife together. Group consent processes were mentioned in a survey study by Kneipp et al.⁴⁹ Our interviewees expressed that both women and men have the right to sign informed consents. None of the interviewees considered the question about who (the husband or the wife) can sign informed consents to be unusual question in Middle East communities. The interviewees thought that some people might believe that men can sign on behalf of their female relatives (wives, sisters, so forth.), which might reflect a cultural difference between the Middle East and the Western countries, where such question might be considered illogical. We were unable to find any study on research biobanks in the West that asked a similar question.

Interviewees reported that withdrawal is a fundamental right of participants and agreed that participants must be aware of this right. This is supported by ethical guidelines and by many studies.^{50,51} Instead, our interviewees acknowledged that besides participants' right of withdrawal, other factors, such as employment of expensive equipment, considerable effort expended by researchers, anonymization, and technical difficulties, needs to be considered in biobank research. This creates a contradiction between rights and welfare of participants vs. scientific interest. It will be unethical to revoke the participants' rights to withdraw their consent for economic gain, as human rights are always given priority. A solution to this contradiction is to permit partial degrees of withdrawal; this solution is preferred by our interviewees and has been applied in many biobanks, including the UK biobank, where no new samples and/or data to be collected; however, already collected samples and data can be used by applying anonymization techniques.⁵² Eriksson and Helgesson introduced the idea of "sufficient reason" in this regard and argued that those wishing to withdraw their samples from being included in the research must present sufficient reasons for doing so.⁴⁸

Children

Our interviewees agreed that it is imperative to conduct research on children. This importance arises from the scientific necessity of conducting clinical research on children and on samples from children, given that children are not simply young adults.⁵³ Moreover, the proportion of children and young people to the total population in Third World societies, including Middle East societies, is generally higher than that in Western societies, thereby increasing the significance of research on children. For example, statistics in Saudi Arabia indicate that children aged under 15 years account for approximately 32.5% of the total population according to Saudi Export Developing Center.⁵⁴

The interviewees' belief that children are vulnerable and need more protection is in line with those of other authors.¹¹ A majority of our interviewees indicated that research on children and on the tissues from children should be conducted only if the research risk is not more than minimum risk. It is now acknowledged that "minimum risk," as stated by many authors, is one of the criteria for permitting research on children.⁵⁵⁻⁵⁸ Research biobanks show no major physical risks; minor risks are related to some issues such as needle prick and allocating time. Other risks can be eliminated by following regulations and guidelines. Besides, consent from the parents, our interviewees emphasized the importance of the practice of obtaining children's assent. According to the interviewees, the researchers should use easy language so that children are able to understand the consent process. The results confirm the importance of obtaining children's consent.¹¹ Both these studies and surveys by Avard et al. and Jackson et al. indicate that effective communication with families regarding the benefits of clinical and genetic research results in a higher percentage of child participation in such research. Nevertheless, the opinions of the interviewees differed with respect to the age at which children should ideally be able to give consent. The opinions of our interviewees varied with respect to the ideal ages of assent, and their suggestions included 7, 10, 12, and 18 years. Other studies suggested that ideal age at which children should be able to give their consent was 12 years old. Besides age, all our interviewees and other researchers were interested in the ability of the children to understand the research and give their assent.^{59,60}

Besides emphasizing the importance of providing all the necessary information to the families for obtaining informed consent, most of our interviewees think that fathers always have priority over mothers in signing informed consent for their children and in case the fathers are not

available, the fathers' designees have priority over the mothers. However, all interviewees preferred that both parents sign consents for research conducted on children. This opinion is also expressed by Diekema for cases in which procedures are not medically required and preferred not to perform these procedures in cases of parental disagreement.⁶¹ However, this study did not discuss which parent has priority. Moreover, we were unable to find any study discussing the priority of the parents in signing consent for inclusion of their child in research. That maybe is related to the manifold social and cultural meanings of adulthood, the self, citizenship and parental authority in diverse societies. We believe that our interviewees' preference to give priority to fathers over mothers stems from religious and social perspectives.⁶²

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REFERENCES

1. Sándor J, Bárd P. Anonymity and privacy in biobanking. *Biobanks and Tissue Research*: Springer; 2011:213-230.
2. Winickoff DE. Governing population genomics: law, bioethics, and biopolitics in three case studies. *Jurimetrics*. 2003:187-228.
3. Launis V, Räikkä J. Genetic democracy: philosophical perspectives. 2008.
4. Ursin LØ, Hoeyer K, Skolbekken J-A. 11 The informed consenters. *Biobanks: Governance in Comparative Perspective*. 2008:177.
5. Prainsack B, Buyx A. A solidarity-based approach to the governance of research biobanks. *Medical law review*. 2013;21(1):71-91.
6. Ducournau P, Cambon-Thomsen A. Users and Uses of the Biopolitics of Consent: A Study of DNA Banks. *The ethics of research biobanking*: Springer; 2009:33-47.
7. Churchill LR, Collins ML, King NM, Pemberton SG, Wailoo KA. Genetic research as therapy: Implications of “gene therapy” for informed consent. *The Journal of Law, Medicine & Ethics*. 1998;26(1):38-47.
8. Secko DM, Preto N, Niemeyer S, Burgess MM. Informed consent in biobank research: a deliberative approach to the debate. *Soc Sci Med*. Feb 2009;68(4):781-789.
9. Elger, B. (2008). Withdrawal of consent and destruction of samples. In *Ethical Issues in Governing Biobanks: Global Perspectives* (131-166). Ashgate Publishing, Ltd.
10. Hens K, Nys H, Cassiman JJ, Dierickx K. Genetic research on stored tissue samples from minors: a systematic review of the ethical literature. *American journal of medical genetics. Part A*. Oct 2009;149A(10):2346-2358.
11. Hens K, Dierickx K. The use of stored tissue samples from minors for genetic research: interviews with professionals. *New Genetics and Society*. 2010;29(3):329-342.
12. Ruiz-Canela M, Valle-Mansilla J, Sulmasy D. Researchers’ preferences and attitudes on ethical aspects of genomics research: a comparative study between the USA and Spain. *Journal of medical ethics*. 2009;35(4):251-257.
13. Ries NM, LeGrandeur J, Caulfield T. Handling ethical, legal and social issues in birth cohort studies involving genetic research: responses from studies in six countries. *BMC medical ethics*. 2010;11(1):4.
14. Meulenkamp TM, Gevers SK, Bovenberg JA, Koppelman GH, Vlieg AvH, Smets E. Communication of biobanks' research results: What do (potential) participants want? *American Journal of Medical Genetics Part A*. 2010;152(10):2482-2492.
15. Hens K, Van El CE, Borry P, et al. Developing a policy for paediatric biobanks: principles for good practice. *European Journal of Human Genetics*. 2013;21(1):2-7.
16. Gurwitz D, Fortier I, Lunshof JE, Knoppers BM. Research ethics. Children and population biobanks. *Science*. Aug 14 2009;325(5942):818-819.
17. Kaufman D, Geller G, Leroy L, Murphy J, Scott J, Hudson K. Ethical implications of including children in a large biobank for genetic-epidemiologic research: a

- qualitative study of public opinion. *American journal of medical genetics. Part C, Seminars in medical genetics*. Feb 15 2008;148C(1):31-39.
18. Abou-Zeid A, Silverman H, Shehata M, et al. Collection, storage and use of blood samples for future research: views of Egyptian patients expressed in a cross-sectional survey. *Journal of medical ethics*. 2010;36(9):539-547.
 19. El-Dessouky HF, Abdel-Aziz AM, Ibrahim C, Moni M, Abul Fadl R, Silverman H. Knowledge, awareness, and attitudes about research ethics among dental faculty in the Middle East: A pilot study. *International journal of dentistry*. 2011;2011.
 20. Lindlof TR, Taylor BC. *Qualitative communication research methods*: Sage; 2010.
 21. Sulmasy DP, Sugarman J. Are withholding and withdrawing therapy always morally equivalent? *Journal of medical ethics*. 1994;20(4):218-224.
 22. Alahmad G, Al-Jumah M, Dierickx K. Review of national research ethics regulations and guidelines in Middle Eastern Arab countries. *BMC medical ethics*. 2012;13:34.
 23. National Committee of Medical & Bioethics (NCMBE). The law of ethics of research on living creatures. Riyadh: King Abdul Aziz City for Science and Technology; 2010.
 24. Kandeel N, El-Nemer A, Ali NM, et al. A multicenter study of the awareness and attitudes of Egyptian faculty towards research ethics: A pilot study. *Journal of Empirical Research on Human Research Ethics: An International Journal*. 2011;6(4):99-108.
 25. Sleem H, El-Kamary SS, Silverman HJ. Identifying structures, processes, resources and needs of research ethics committees in Egypt. *BMC medical ethics*. 2010;11:12.
 26. Ajuwon AJ, Kass N. Outcome of a research ethics training workshop among clinicians and scientists in a Nigerian university. *BMC medical ethics*. 2008;9(1):1.
 27. Perkovic V, Patil V, Wei L, Lv J, Petersen M, Patel A. Global randomized trials: the promise of India and China. *The Journal of Bone & Joint Surgery*. 2012;94(Suppl 1 (E)):92-96.
 28. Al-Zarga M. *Al-Fiqh al-Islami Wa Madaresoh (Islamic jurisprudence and its schools)*. Damascus: Dar Al-Shameia.; 1995.
 29. Ismail S. *Al-ijtihad al-jamai wa dawr al majamea al-fekhia fi tatbeekoh (Plural Ijtihad abd the role of jursitic councils of its use)*. Damascus: Dar al-basha'er al-islamia; 1997.
 30. Pew Research Center., Pew Forum on Religion & Public Life. *Mapping the global Muslim population : a report on the size and distribution of the world's Muslim population*. Washington, District of Columbia: Pew Research Center; 2009.
 31. Al-Sultan A, Al-Abdulahadi A. *Al-Ijtihad ak-Jama'ee (Plural Ijtihad)* [PhD]. Riyadh: Higher Institute of Justice, University of Imam Muhammad bin Saud Islamic University.; 2009.
 32. International Islamic Fiqh Academy (IIFA). Decision about juridical regulation of biomedical research on human. . 161 (17/10). Amman 2006.

- <http://www.fiqhacademy.org.sa/qararat/17-10.htm>. Accessed September 24, 2014.
33. International Islamic Fiqh Academy (IIFA). *Decision about medical treatment*. 67 (7/5). Vol 67. Jeddah 1992.
 34. International Islamic Fiqh Academy (IIFA). *Decision about medical confidentiality* . 79 (8/10) 1993. <http://www.fiqhacademy.org.sa/qararat/8-10.htm>. Accessed September 24, 2014.
 35. Islamic Fiqh Council (IFC). *Genetic engineering*. 1 (15)1998.
 36. Islamic Fiqh Council (IFC). *Stem cells*. 3 (17). Makkah2002. <http://www.themwl.org/Fatwa/default.aspx?d=1&cidi=152&l=AR&cid=12>. Accessed September 24, 2014.
 37. Lenoir N. Universal declaration on the human genome and human rights: the first legal and ethical framework at the global level. *Colum. Hum. Rts. L. Rev.* 1998;30:537.
 38. Ashcroft R. The ethics of reusing archived tissue for research. *Neuropathol Appl Neurobiol.* Oct 2000;26(5):408-411.
 39. Giordano J, O'Reilly M, Taylor H, Dogra N. Confidentiality and autonomy: the challenge(s) of offering research participants a choice of disclosing their identity. *Qualitative health research*. Feb 2007;17(2):264-275.
 40. Deschenes M, Cardinal G, Knoppers BM, Glass KC. Human genetic research, DNA banking and consent: a question of 'form'? *Clin Genet.* Apr 2001;59(4):221-239.
 41. Brohan E, Slade M, Clement S, Thornicroft G. Experiences of mental illness stigma, prejudice and discrimination: a review of measures. *BMC health services research*. 2010;10:80.
 42. Shaw A, Hurst JA. 'I don't see any point in telling them': attitudes to sharing genetic information in the family and carrier testing of relatives among British Pakistani adults referred to a genetics clinic. *Ethn Health*. Apr 2009;14(2):205-224.
 43. Aziz H, Akhtar SW, Hasan KZ. Epilepsy in Pakistan: stigma and psychosocial problems. A population-based epidemiologic study. *Epilepsia*. Oct 1997;38(10):1069-1073.
 44. Al-Gazali L, Hamamy H, Al-Arrayad S. Genetic disorders in the Arab world. *BMJ*. Oct 21 2006;333(7573):831-834.
 45. Halkoaho A, Pietila AM, Vesalainen M, Vahakangas K. Ethical aspects in tissue research: thematic analysis of ethical statements to the research ethics committee. *BMC Med Ethics*. Aug 8 2012;13(1):20.
 46. Molyneux S, Geissler PW. Ethics and the ethnography of medical research in Africa. *Social science & medicine (1982)*. 2008;67(5):685.
 47. Deschenes M, Cardinal G, Knoppers B, Glass K. Human genetic research, DNA banking and consent: a question of 'form'? *Clinical genetics*. 2001;59(4):221-239.
 48. Eriksson S, Helgesson G. Potential harms, anonymization, and the right to withdraw consent to biobank research. *European Journal of Human Genetics*. 2005;13(9):1071-1076.
 49. Kneipp SM, Lutz BJ, Means D. Reasons for Enrollment, the Informed Consent Process, and Trust Among Low-Income Women Participating in a Community-

- Based Participatory Research Study. *Public Health Nursing*. 2009;26(4):362-369.
50. Hug K, Hermerén G, Johansson M. Withdrawal from biobank research: Considerations and the way forward. *Stem Cell Reviews and Reports*. 2012;8(4):1056-1065.
 51. Pawlikowski J, Sak J, Marczewski K. Biobank research and ethics: the problem of informed consent in Polish biobanks. *Arch. Med. Sci.* 2011;7:896-901.
 52. UK Biobank. Ethics & Governance Framework. 2007. <http://www.ukbiobank.ac.uk/wp-content/uploads/2011/05/EGF20082.pdf>
 53. Pinxten W, Nys H, Dierickx K. Frontline ethical issues in pediatric clinical research: ethical and regulatory aspects of seven current bottlenecks in pediatric clinical research. *European journal of pediatrics*. Dec 2010;169(12):1541-1548.
 54. Saudi Export Developing Center. Department of Statistics and Information. (2007). *Demographic Survey in 1428 AH (2007 AD)*. Riyadh, Saudi: Ministry of Economy and Planning; 2007.
 55. Levine RJ, Genel M, Cuttler L, Becker DJ, Nieman L, Rosenfield RL. Overcoming burdens in the regulation of clinical research in children. Proceedings of a consensus conference, in historical context. *International journal of pediatric endocrinology*. 2011;2011(1):19.
 56. Hunfeld JA, Passchier J. Participation in medical research; a systematic review of the understanding and experience of children and adolescents. *Patient education and counseling*. Jun 2012;87(3):268-276.
 57. Hens K, Levesque E, Dierickx K. Children and biobanks: a review of the ethical and legal discussion. *Human genetics*. Sep 2011;130(3):403-413.
 58. Davidson AJ, O'Brien M. Ethics and medical research in children. *Paediatric anaesthesia*. Oct 2009;19(10):994-1004.
 59. Avar D, Silverstein T, Sillon G, Joly Y. Researchers' perceptions of the ethical implications of pharmacogenomics research with children. *Public Health Genomics*. 2009;12(3):191-201.
 60. Jackson C, Dixon-Woods M, Tobin M, Young B, Heney D, Pritchard-Jones K. Seeking consent to tissue banking: a survey of health professionals in childhood cancer. *Eur J Cancer Care (Engl)*. Jul 2009;18(4):391-400.
 61. Diekema DS. Ethical issues in research involving infants. Paper presented at: Seminars in perinatology 2009.
 62. Alshankeeti MM. *Rules of surgery*. 3 ed. Alshareja, UAE: Maktabot Alsahaba; 2004.

Interview Guide

Confidentiality, Informed consent and children participation in the stored tissue samples: Interviews with professionals from Middle East

This questionnaire includes 4 parts:

1. Introduction
2. Confidentiality
3. Informed consent
4. Children

First: Profile of the institution and the collection and the interviewed biobank staff OR IRB member

1. Can you give a short description of your position, and background?
2. Are you involved in biobanks, IRB or both? If so, why?
3. Tell me more about your experience with and work in the biobanks, IRB or both?
4. Have you previously been involved in another biobank, IRB or both in another institute? For how long? Do you see any differences between both institutes?
5. How did you become involved in bioethics?
 - a. by courses:
 - 1) in medical research ethics
 - 2) in biobanking ethics
 - 3) both
 - b. by experience and research:
 - c. by both courses and experience and research
 - d. other
6. Can you give a short description of the biobank, and its aims? Is the biobanks disease-related or population -related? What diseases are studied?
7. How long have you been working at your biobank or IRB?
8. Is your biobank part of a university, research center, hospital or others? Explain.
9. How many staff members are engaged in the collecting, storing, and maintaining of bodily materials from patients and donors?
10. Whose material is included in your biological sample collection (select all that apply)
 - a. Healthy volunteers (for control studies or other studies?)
 - b. Patients
 - c. Participants of clinical and research studies
 - d. Citizens, looking for genetic advice
- Please explain
11. Do you document and store links between individual members of families?
12. How long do you intend to store biological samples
 - a. For future genetic research?
 - b. For clinical/diagnosis purposes?
 - c. For control studies?
13. Which associated data do you keep? (medical data, lifestyle data, environmental data, etc....). Please give some examples.
 - a. For future genetic research?

- b. For future medical research?
 - c. For clinical/diagnosis purposes?
 - d. For control studies?
14. Have you documented your legal and ethical procedures of storage of biological samples for:
- a. For future medical research?
 - b. For future genetic research?

Can we have a copy of these procedures? Is this documentation accessible to the general public?

15. What is the size of the biobank (in number of samples)? How many raw tissue samples do you have? How many extracted DNA samples do you have?
16. Do you think being biobanks in Islamic countries will have different challenges than in other countries?
- a. Yes
 - b. No
 - c. Maybe

Why?

- a. Do you think Islamic law affects biobanks differently?
- b. Do you think Muslims have different perspectives or habits that may affect the biobanks?

What are these challenges?

17. Do you think the biobanks in the Middle East will have different challenges than other biobanks? Why? What are these challenges? Are these challenges related to religion (Islam)?
18. Considering your position, what are the most pressing challenges in research biobank (select all that apply) * :
- a. Confidentiality
 - b. Informed consent
 - c. No harm
 - d. Others: please specify.

19. Do you think Islamic rules are able to control all challenges in research biobanks?

20. Are you aware about Islamic fatwas regarding:

- a. Medical research
- b. Genetic research
- c. Research Biobanks

If yes:

- 1) Which ones? Please explain.
- 2) Do you think we need more fatwas?

21. Do you think we need more regulation in regarding to:

- a. Medical research?
 - 1) National
 - 2) Institutional
- b. Biobanking?

* We start here to talk about research biobank rather than biobank in general.

- 1) National
- 2) Institutional

If not, please explain.

Second: Confidentiality

1. What according to you, is the major challenge with regard to confidentiality protection and the use of:
 - a. Stored tissue samples?
 - b. Data and information?
 Please explain
2. What is the ideal protection in your opinion to confidentiality in biobanking?
3. Do you think confidentiality is well protected through the procedures and guidelines in your institute?
4. How is material for non-therapeutic research stored? Anonymous, coded, directly identifiable?
5. Do you think genetic information is:
 - a. Individual only
 - b. Familial only
 - c. Both individual and familial
6. Can confidentiality breaching be risky? If yes what are its risks?
7. Do you agree with sending genetic material outside the country for both clinical diagnosis and research? Why? Please explain.

Third: Informed consent

1. What do you think are the major challenges with regard to informed consent in biobanks?
2. Is informed consent mandatory or optional? And who has to sign the consent in the case of male participants and also female participants. Please explain.
3. Which kind of informed consent do you prefer: general informed consent or consent for each study? Why?
4. Do you think most research participants in your biobank/ research are capable of understanding the information presented in informed consent documents?
5. Do you think that the process of getting the informed consent is good enough to empower the potential participant to make an informed choice to participate or not to participate in the study? Please explain.
6. In biobanks, which is better: one-time consent for all research conducted in the donated samples and data, or offering consent for each study conducted on the same samples? Why?
7. Do you allow withdrawal of participants? If yes, do you think that withdrawal must be a one degree or multiple degrees, and why?
8. Which choices of degree of withdrawal have to be available?

Fourth: Children

1. What do you think are the major challenges with regard to the use of human tissue samples from minors?
2. Do you think that minors have to participate in biobanks? Why?

3. Do you think there are differences between involving the children in clinical trials and in biobanks?
4. For which ages do you think we should have to ask for:
 - a. Only consent from the parent(s)
 - b. Consent from the parents, plus assent from the child
 - c. Assent from the child only
5. Do we have to ask consent of:
 - a. Father only
 - b. Mother only
 - c. Both parents
 - d. None

Do we need to offer more protection for information and data from children, or the same amount as we do for that from adults?

Chapter 5

Attitudes toward medical and genetic confidentiality in the Saudi research biobank: an exploratory survey

Alahmad, G., & Dierickx, K. (2014).

ABSTRACT

Achieving a balance between giving access to information and respecting donors' confidentiality is a crucial issue for any biobank, with its large number of samples and associated information. Despite the existence of much empirical literature on confidentiality, there are too few surveys in the Middle East about the topic, particularly in the Saudi context. A survey was conducted of 200 respondents at King Abdulaziz Medical City in Riyadh, Saudi Arabia, among five groups of equal size, which included researchers, physicians, medical students, donors and laypersons. The majority of participants agreed that confidentiality is an important issue and that it is well protected in the Saudi biobank. All five groups showed different attitudes toward disclosing information to various third parties. They were in favor of allowing treating physicians, and to a certain extent family members, to have access to medical and genetic results from research. No significant difference was found between views on medical and genetic confidentiality. The majority of the respondents agreed that confidentiality may be breached in case of justified reasons. Even considering differences in religion, culture, and other factors, the study's results were consistent with results presented in the literature and research conducted in other countries.

Key words: Confidentiality; Survey; Ethics; Biobank; Genetic research

INTRODUCTION

Medical research on stored samples is very important for discovering the mechanisms and pathology of diseases and for developing appropriate treatments.¹ Establishing research biobanks with huge numbers of samples and personal and genetic data will contribute to wide advances in medical research, especially through computerizing information and medical records to enable easy and safe access to medical information needed for empirical research.^{1,2} Having access to medical information is necessary for conducting medical research; however, unintended leakage of information may cause very dangerous results.³ So, research biobanks

usually use various mechanisms to keep medical confidentiality intact, such as coding and security systems. Medical confidentiality is crucial in all human relationships and medical matters including medical research, and safeguarding the confidentiality of medical information is an ethical duty of all medical workers and researchers.⁴ Medical confidentiality is essential for trust, which is considered necessary to conduct research; it enables the conditions where research participants will give correct and accurate information.^{3,5} Genetic information holds a special importance because it is related to sensitive issues that may be attached not only to the person himself but also to his relatives. It is very essential to have a balance between the necessities of giving access to information for research purposes on one side and the obligation of respecting medical confidentiality on the other side. Any disclosure of medical information in clinical research or practice must be according to informed consent by participants to allow researchers to access or disclose any information related to participants.^{6,7} However, in some situations disclosing medical information without consent by research participants may be justified in order to avoid greater harm, or in cases of clear individual or societal benefits, like notification of infectious diseases, such as AIDS.⁸ Confidentiality is not limited to information provided by research participants, or taken from their samples or data but also extends to the research results.^{9,10}

Because of the importance of medical and genetic confidentiality, and the lack of surveys in the Middle East about it, particularly in the Saudi context, research in the field is necessary.

METHODS

This study was an investigation of the views of a random sample of employees and visitors in the King Abdulaziz Medical City, Riyadh, Saudi Arabia on the topic of confidentiality in medical and genetic research, especially in the research biobank in Saudi Arabia, which was established recently. This study comprised five different groups, each consisting of 40 participants. These five groups included physicians, researchers, medical students, donors, and laypersons. The researchers are working in the King Abdul International Medical Research Center (KAIMRC), the physicians are working in the King Fahad Hospital, National Guard, and the medical students are at the University of King Saud bin Abdulaziz University for Health Sciences. The members of donors group comprised individuals who previously agreed and donated samples for the purposes of research,

and finally the laypersons group included persons who visited hospital or were companions of patients. The questionnaires were collected personally by two trained research coordinators and one medical student during an eight-month period until reaching our target number 200 respondents.

Several specialists from different medical specialties, such as research, quality management and a general practitioner reviewed the questions in order to ascertain the suitability, effectiveness, reliability, and content validity.

Survey questions were written in English and then translated into Arabic, and the content of Arabic copy has been validated. The English version was used to elicit the views of groups of physicians, researchers, and medical students while the Arabic version was used to elicit the views of donors and the public.

The questions included several sections. The first questions inquired about participants' personal information. Questions in 2nd section measured their attitude towards the importance of confidentiality in medical research as well as the actual respect of confidentiality in the research center. The 3rd section assessed participants' views on the accessibility of medical and genetic information by different people. The 4th section assessed participants' views about providing research results to others. Finally, in the 5th section we explored participants' views about the justified reasons to disclose confidential medical information to third parties.

The Institutional Ethics Committee at the King Abdullah International Medical Research Center granted an approval to conduct this research. We collected approval from all participants and informed them about the research and its goals before gathering any information from them. We assured them about the issue of respect for privacy and confidentiality at all stages of the search. We also gave participants the right to withdraw at any time without any negative consequences.

The data were collected and analyzed using the program SPSS, 19 edition. All items were measured on a 5-point Likert scale, which we then converted to a 3-point Likert scale to conduct statistical analysis and estimate the standard deviation.

The study used Chi Square test and ANOVA test to test between group differences and considered the *p*-value of less than 0.05.

RESULTS

Personal Characteristics

This study comprises 200 respondents from five different groups, who differ significantly in age, sex and education ($P < 0.001$). More women are involved and the majority of respondents were between 26-40 years. Almost all physicians had a post graduate degree, while laypersons and donors have lower educations. (Table 1)

Table 1: Socio-demographic characteristics of the study groups:

	Researchers	Physicians	Students	Donors	Laypersons	Totals
18-25 years	7.5%	5%	77.5%	37.5%	17.5%	29%
26-40 years	85%	75%	22.5%	57.5%	57.5%	59.5%
41-55 years	7.5%	17.5%	0%	2.5%	20%	9.5%
>55 years	0%	0%	0%	2.5%	2.5%	1%
$\chi^2 = 80.865, P < 0.001$						
Male	27.5%	62.5%	75%	15%	40%	44%
Female	72.5%	37.5%	25%	85%	60%	56%
$\chi^2 = 39.489, P < 0.001$						
None/ Primary	0%	0%	0%	10%	17.5%	2.8%
Secondary School / Diploma	20%	0%	45%	30%	30%	25.1%
Bachelor	25%	2.6%	37.5%	50%	35%	35.2%
Postgraduate	30%	97.4%	17.5%	10%	17.5%	34.2%
$\chi^2 = 107.533, P < 0.001$						

Confidentiality in Theory and Practice

When investigating two issues (firstly if medical information is considered secret information and secondly if data confidentiality is well protected in Saudi biobank), the majority of respondents agree that medical information is secret and that confidentiality is protected. However, one significant difference is found: while more than 90% agree on the 1st issue, only about two thirds agree on the 2nd issue.

Donors indicated the lowest degree of agreement regarding the necessity of keeping medical information confidential ($P < 0.001$), and both donors and laypersons agree less than others that data confidentiality is well protected in the Saudi biobank.

When comparing the two opinions of the same group about both issues, we find that respondents intend to agree less on the second issue. (Table 2)

Table 2 Attitudes toward confidentiality in theory and practice

	Researchers	Physicians	Students	Donors	Laypersons	Total
Agree that medical information in clinical research must be dealt as secret information	97.5%	95.0%	97.5%	70.0%	94.9%	91.0%
Agree that data confidentiality is well protected in this research center or biobank	75.0%	72.5%	62.5%	47.5%	45.0%	60.5%

Medical and Genetic Confidentiality

For giving access to clinical and genetic information in research to different groups or individuals or institutions, respondents show high levels of agreement (>80%) with giving access to donors and the treating physician and a moderate level of agreement with providing access to researchers in Saudi Arabia. However there is a low level of agreement with giving access to government, insurance companies, and to researchers outside Saudi Arabia.

There is no significant difference among the study groups in giving medical and genetic information to others, except in three cases. Researchers are least likely to agree to give medical information to donors, compared with other groups. The donors are most likely to agree to provide medical information to insurance companies. However, the students were least likely to agree with providing genetic information to the treating physician.

When comparing agree of giving access of medical information to individuals or institutions versus genetic information there is no significant difference.

Table 3 Attitudes toward access to medical and genetic Information among study groups

	Researchers	Physicians	Students	Donors	Laypersons	Total	<i>P</i> value
The biobank may provide any medical information to donor	75%	90%	87.5%	97.5%	95%	89%	< 0.001
The biobank may provide any genetic information to donor	82.5%	95%	85%	92.5%	92.5%	89.5%	0.14
The biobank may provide any medical information to insurance companies	32.5%	25%	42.5%	62.5%	27.5%	36%	0.04
The biobank may provide any genetic information to insurance companies	27.5%	37.5%	27.5%	50%	30%	34.5%	0.24
The biobank may provide any medical information to researchers inside Saudi	60%	55%	65%	60%	50%	58%	0.35
The biobank may provide any genetic information to researchers inside Saudi	57.5%	55%	65%	47.5%	55%	56%	0.60
The biobank may provide any medical information to researchers outside Saudi	37.5%	50%	47.5%	37.5%	42.5%	43%	0.24
The biobank may provide any genetic information to researchers outside Saudi	35%	50%	40%	35%	42.5%	40.5%	0.22
The biobank may provide any medical information to treating physician	75%	77.5%	82.5%	90%	87.5%	82.5%	0.05

The biobank may provide any genetic information to treating physician	77.5%	82.5%	67.5%	92.5%	85%	81%	< 0.001
The biobank may provide any medical information to government	35%	37.5%	60%	40%	50%	44.5%	0.50
The biobank may provide any genetic information to government	41%	37.5%	55%	37.5%	42.5%	42.7%	0.54

Genetic Confidentiality among Family Members

When investigating giving genetic information to different family members, respondents showed moderate agreement. Respondents were most likely to agree with providing genetic information to both parents, followed by sons and daughters. However, less than half of them agree to give access to brothers and sisters.

Study groups differ significantly in providing genetic information to each of the family members. Donors and laypersons have the highest agreement towards providing access to each family member, while medical physicians agree the least. Researchers and medical students score in the middle (Table 4)

Table 4: Attitude toward access to genetic Information among family members in relation to profession

	Researchers	Physicians	Students	Donors	Laypersons	Total	<i>P</i> value
The biobank may provide any genetic information to mother	55%	37.5%	57.5%	82.5%	77.5%	62%	<0.001
The biobank may provide any genetic information to father	55%	40%	57.5%	85%	77.5%	63%	<0.001
The biobank may provide any genetic information to brother	40%	17.5%	40%	80%	60%	47.5%	<0.001

The biobank may provide any genetic information to sister	37.5%	20%	35.5%	80%	57.5%	46%	<0.001
The biobank may provide any genetic information to son	47.5%	30%	47.5%	82.5%	67.5%	55%	<0.001
The biobank may provide any genetic information to daughter	45%	22.5%	50%	82.5%	65%	53%	<0.001

Justified Breach of Confidentiality

Three possible reasons are used to investigate justified breaching of confidentiality among the study groups (Table 5). While the majority of respondents agree that infectious and genetic diseases are justified reasons to breach confidentiality, a lower percentage of respondents agree that confidentiality can be breached according to a court order. However, a much lower percentage agrees to breach confidentiality for other undefined reasons. The study groups do not differ significantly in terms of justified reasons to breach confidential information.

Table 5: Attitudes towards justified reasons for breaching confidentiality among the study groups

	Researchers	Physicians	Students	Donors	Laypersons	Total	<i>P</i> value
The biobank may give confidential medical information in infectious diseases	70%	75%	72.5%	80%	80%	75.5%	0.76
The biobank may give confidential medical information in shared genetic diseases	70%	55%	75%	82.5%	80%	72.5%	0.05
The biobank may give confidential medical information in court order	55%	42.5%	65%	67.5%	62.5%	58.5%	0.23
The biobank may give confidential medical information for other reasons	22.5%	17.5%	15%	30%	32.5%	23.5%	0.48

DISCUSSION

The majority of participants agree on the confidentiality of medical/genetic information and a smaller majority agrees that confidentiality is well protected in the Saudi biobank. Donors agree less on both points, and laypersons agree less only on the second point.

Confidentiality in genetic research in stored tissue samples is a vital issue because information may be related to sensitive points, and because genetic information is not only individual but also familial information.^{3,11,12} Breaching confidentiality might lead to negative impacts on a donor and his relatives, in the present and future.¹³ A high percentage of agreement among respondents (above 90%) for considering medical information as confidential can possibly be explained by the fear of stigma both for donors and for their families, especially in a society such as Saudi Arabia where there are high rates of consanguinity and inherited diseases.¹⁴

Having good methods to protect information is essential in any biobank.^{15,16} So, it is not a surprise to see that those who have the most experience and knowledge about the Saudi biobank procedure and protections, such as physicians and researchers, give the highest positive response rate about confidentiality protection in Saudi biobank, with researchers being the highest at 75%. This is interesting because having a greater understanding of the limits and expectations of people and increasing their awareness about the biobank's values and protection procedures including respecting confidentiality might build trust and consequently raise participation rates.^{17,18}

Access to Genetic/Medical Information

More respondents agree with giving access to donors and treating physician than to researchers in Saudi Arabia, and much less to government, insurance companies, and researchers outside Saudi Arabia. Researchers agree at a lower rate with giving access to donors, and medical students are the least likely to agree with providing genetic information to a treating physician. There is no any significant difference between views on medical and genetic confidentiality.

Disclosure of individual information to the research participant has received a lot of discussion and debate since the 1990s.¹⁹ Our research

question here concentrates on confidentiality and giving access to family members without reference to an inherited disease, which is totally different from disclosure of information to the relative who may have the same disease, for the sake of better management of the disease in the future—which is extensively researched in medical literature.

The majority of people felt that the donors themselves should have access to medical information, and all groups agree on that regarding genetic information. This result is in line with some other surveys and interviews.¹⁹⁻²² Many researchers agree on the importance of disclosing significant individual information to research participants because they consider it is a participant's right to know related information of his/her samples and data,^{19,23} and because of its possible diagnostic or therapeutic benefits,²⁴⁻²⁶ and also because having such information will help the participant make decisions autonomously either to continue or to withdraw from research.^{19,27} Moreover, some authors agree on disclosing information even when it is non-significant information.^{23,28} On the other hand some other researchers object to disclosing information to research participants because they believe this information is stressful and may be as harmful as it is beneficial.^{19,29} Because a significant amount of stress can come from disclosing information,³⁰ counseling and advice are needed, which increases the cost of research.^{19,22}

Participants' information in research biobanks may help treating physicians to offer better care and reduce diagnostic procedures if they get access to this medical and genetic information. However physicians have to treat the information with strict confidentiality.^{3,31,32} This positive attitude toward giving access to information to medical doctors is seen as well in other studies.³³ Donors in particular think it is necessary that physicians have access to this information (90% of respondents in this group), which suggests that there is a high degree of trust in treating physicians, because trust is very important to encourage research subjects to disclose confidential information.^{5,34} However, it may also reflect a kind of therapeutic misconception, in which participants in research biobanks may think that the purpose of the study is therapeutic and has medical benefits rather than just being focused on research.^{19,35-37}

Sharing information is important in biobank work, especially in multicenter research, which may put confidentiality at risk and cause damage to individuals and families in case of sensitive information.⁵

Studies have shown that participants generally agreed that information sharing with others would be acceptable, as would sharing with nonprofit, public-interest research organizations.³³ Interestingly, there seems to be a discrepancy between who gets access to the information in the research biobank. Researchers inside Saudi Arabia (where the study was conducted) were seen as more favorable candidates for receiving medical and genetic information across the groups—all values are around or above 50%. Those in favor of giving access to researchers abroad may feel that it is necessary for diagnostic purposes especially in rare and complicated diseases.³⁸ Also maybe they feel that confidential information is more secure when it is used outside, since it is inaccessible to people inside. It is interesting that people were slightly less likely to believe that access to their medical and genetic information should be allowed to researchers outside Saudi Arabia compared with researchers inside Saudi. However, for people who prefer to limit access to Saudi researchers, the possible reason for this could be that people want their information to stay local and to be used in research that will help those living in their home country. Saudi law forbids sending genetic samples except in strict conditions and only through the National Committee of Bio Ethics.³⁹

All five groups were least likely to have positive attitudes (36%) towards giving access to medical and genetic information in research biobanks to insurance companies. The remaining percentage may have concerns in this regard that are much higher when compared with the findings of an interview conducted in the US by Ormond et al., where only 25% of respondents mentioned insurance discrimination as one of their concerns.³⁶ The relationship between confidentiality and information disclosure and discrimination toward individuals and vulnerable groups has been mentioned by other researchers.⁵ This suggests that people are aware of how medical and genetic information from research biobanks may affect their coverage by health insurance. Even though the Saudi government offers free health services to all Saudi nationals, without a need to be insured, non-Saudi people working in Saudi may be affected by the leaking of information to insurance companies, since non-Saudis are not covered by insurance unless they are working for governmental authorities.⁴⁰ Fear of any consequences of having access to medical and genetic information by insurance companies reflects on how fast genetic research moves and the ways it may affect individuals in the future. Von Ferber et al. suggest that this may be a result of “confused thinking” since research results are unlikely to get into the hands of insurance companies

anyway.⁴¹ They note that it is illegal to use information from research to make any decisions regarding insurance premiums. This also is illegal in Saudi Arabia.⁴⁰

Many research biobanks mention preventing discrimination, including the Icelandic, Estonian, and Saudi biobanks.⁴²⁻⁴⁴ Also, international documents, such as the International Declaration on Human Genetic Data by UNESCO, the Statement on human genomic databases by the Human Genome Organisation's Ethics Committee HUGO, and the Genetic Databases by WHO have provisions against discrimination.⁴⁵⁻⁴⁷ Despite this, it is evidently a significant concern for respondents to this questionnaire.

Disclosing Genetic Information to Family Members

Respondents mostly agree with providing genetic information to both parents, followed by sons and daughters, and least to brothers and sisters. Donors and laypersons agree more than others, followed by researchers and students; however, medical doctors were the least to agree with sharing genetic information with family members.

Genetic information is not just individual information but also familial, in that family members share a significant part of their genes.^{13,48,49} Therefore it may have consequences for the health of family members and relatives.^{50,51} Any disclosing of genetic information may have a direct impact on other family members.^{34,52,53}

Our research question in this study is a general question on confidentiality of information and disclosing an individual's information to family members without reference to a possible familial inherited disease. We only investigated the research participants' positions regarding disclosing their medical and genetic information to the very closely related people. However, disclosure of information to at risk relatives who may have the same inherited disease in the future, for better management, showed a conflict between respecting confidentiality and reducing the possible harm to relatives, besides the moral duty to inform at risk relatives, which is extensively researched in medical literature.⁵⁴⁻⁵⁷

Donors showed more positive attitudes to disclose information to other family members compared with others, probably because they may be less likely to understand genetic information, or they may feel more

family solidarity. Individuals need support and education about the implications of genetic information.⁵¹ The physicians were the least likely to allow disclosure of genetic information to other family members. This can be explained by the physicians being more aware of the consequences of information disclosure, or because they are more sensitive regarding legal results in case of any risk that may occur because of disclosing. Some other authors suggest developing a family-based numerical coding procedure that would allow the use of confidential data and the determination of familial relationships without risk of disclosure.⁵⁸

Justified Breach of Confidentiality

The majority of the respondents agree that infections, genetic diseases, and court orders may be justified reasons to breach confidentiality, without any significant difference among the groups.

It is important to have balance between better health for the community and respect for the right of confidentiality and privacy of individuals participating in research.⁵⁹ However, in some cases an absolute respect for confidentiality leads to greater harm.^{60,61} Many authors, such as Beauchamp and Childress, consider two factors of harm, which are the probability and the magnitude of potential harm.⁸

In the current study, we asked our respondents about some possible reasons that may justify the breaching of confidentiality. The two main reasons the respondents felt the breaching of confidentiality could be beneficial were cases that involve either infectious diseases or shared genetic diseases. Even though there is no significant difference among groups, donors and laypersons were more supportive of giving confidential information for these two reasons. A lot of literature supported the claim of safeguarding public health, and added an addendum to cover the justification of using genetic information to override individual confidentiality,^{62,63} especially when the information may help relatives who are at risk.⁵⁴⁻⁵⁷ The majority of national and international research regulations gives research participants the absolute right to keep the information confidential and not to have genetic information of stored research samples disclosed to a third person. However, this is questioned when encrypted information is used, especially when the research subject is part of a family and societal structure and he/she is responsible of their well-being. Some resources

such as HUGO give immediate relatives the right of access to stored DNA for the purpose of learning about their status in the case of high risk.⁴⁸

Disclosing genetic information to at risk relatives is particularly important in close-knit communities with extended families and high percentages of interfamily marriages, like the case in Saudi Arabia where we can find isolated and semi-isolated genes among many people who live there.⁶⁴ Governance of the Saudi biobank allows giving confidential information by a higher authority for safeguarding important public interests, or to avoid threats to the welfare of the community. According to Islamic fatwa No. 79 (10/8) 1993, issued by the International Islamic Fiqh Academy, a breach of confidentiality can be acceptable only if the harm of maintaining confidentiality overrides its benefits.⁶⁵ This Islamic opinion is assured by the position of the Islamic Organization for Medical sciences and the writings of many authors.^{66,67}

Interestingly, the groups were very split on court orders and court cases being reasonable justification for breach of confidentiality—only around 60% of respondents felt that this was legitimate. This study is supported by results of other research that allow having access to information without consent, even with the presence of a "Confidentiality Certificate".^{68,69} Saudi biobank's governance agrees to disclose confidential information, as permitted by authority order, for investigating criminal acts. Islamic opinion shows a similar position and agrees with disclosing of confidential information according to legal demands.^{66,67}

The least popular reason for breaching confidentiality is the vague "other reasons." Of our respondents, 23.5% do not mind where the research center gives their results, but the majority would probably prefer some type of explanation about the breach of confidentiality. Some authors mention cases where there is a need to use identified information in order to validate research results, or for publication reasons. Using anonymized information gives a good solution. Some biobanks require decoding and disclosing donors' information for quality assurance, as is the case in the Saudi biobank.⁴⁴

CONCLUSIONS

There are many interesting conclusions that can be drawn from this research. Firstly, confidentiality is an important issue according the

majority of participants, without a significant difference between the disclosure of genetic information and general medical information. Secondly, overall, all five groups showed different attitudes toward disclosing information to the various third parties. They were in favor of treating physicians, and to a certain extent family members, having access to medical and genetic results from research. People were much more likely to want their results to be shared with other researchers within Saudi Arabia than outside, probably because they want their results to help the local community. Even with the positive attitude to respect medical/genetic confidentiality, the majority of respondents agree to disclose information where is a justified reason, such as sharing genetic information with at risk relatives or in response to a court order.

Generally, even considering differences in religion, culture, and other factors, all our results are consistent with results presented in the literature and research conducted in other countries. Future research could focus on the importance of keeping research genetic results local and not transferring them out of the country, as well as investigating how people feel about their genetic profiles being made public.

Limitations

Our study has many limitations; first, the participants in the “Researchers,” and “Physicians” groups could represent a substantial proportion of medical specialists in Saudi Arabia, especially in that they may represent particular persons who work at the tertiary medical centres. “Researchers” and “Physicians” groups may have more positive attitudes because their work at the same centre where the study is conducted. Second, because the results came from a specific geographical area, they may not be generalizable to other geographical areas. Thus, it would be important to increase the sample size and have samples from different regions in future research. Third, “Donors” and “Laypersons” groups were helped by research coordinators and may be affected by their explanation, while for other groups a self-administration style was used.

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REFERENCES

1. Khoury MJ, Millikan R, Little J, Gwinn M. The emergence of epidemiology in the genomics age. *International journal of epidemiology*. Oct 2004;33(5):936-944.
2. Ethikrat D. *Biobanks for Research: Opinion*. Deutscher Ethikrat, Berlin; 2004..
3. Giordano J, O'Reilly M, Taylor H, Dogra N. Confidentiality and autonomy: the challenge(s) of offering research participants a choice of disclosing their identity. *Qualitative health research*. Feb 2007;17(2):264-275.
4. Ryen A. Ethical issues. *Qualitative research practice*. 2004:230-247.
5. Smith E. The limits of sharing: an ethical analysis of the arguments for and against the sharing of databases and material banks. *Accountability in research*. Nov 2011;18(6):357-381.
6. Wendler D. Consent for research with biological samples: one-time general consent versus a gift model. *Annals of internal medicine*. 2012;156(8):596-598.
7. Woodward B. Confidentiality, consent and autonomy in the physician-patient relationship. *Health care analysis : HCA : journal of health philosophy and policy*. 2001;9(3):337-351.
8. Beauchamp TL, Childress JF. *Principles of biomedical ethics*. 6th ed. New York: Oxford University Press; 2009.
9. Godard B, Marshall J, Laberge C. Community engagement in genetic research: results of the first public consultation for the Quebec CARTaGENE project. *Public health genomics*. 2007;10(3):147-158.
10. Renegar G, Webster CJ, Stuerzebecher S, et al. Returning genetic research results to individuals: points-to-consider. *Bioethics*. Feb 2006;20(1):24-36.
11. Ashcroft R. The ethics of reusing archived tissue for research. *Neuropathol Appl Neurobiol*. Oct 2000;26(5):408-411.
12. Deschenes M, Cardinal G, Knoppers BM, Glass KC. Human genetic research, DNA banking and consent: a question of 'form'? *Clin Genet*. Apr 2001;59(4):221-239.
13. Brohan E, Slade M, Clement S, Thornicroft G. Experiences of mental illness stigma, prejudice and discrimination: a review of measures. *BMC health services research*. 2010;10:80.
14. Al-Gazali L, Hamamy H, Al-Arrayad S. Genetic disorders in the Arab world. *BMJ*. Oct 21 2006;333(7573):831-834.
15. Taupitz J, Weigel J. The necessity of broad consent and complementary regulations for the protection of personal data in biobanks: what can we learn from the German case? *Public health genomics*. 2012;15(5):263-271.
16. Budimir D, Polasek O, Marusic A, et al. Ethical aspects of human biobanks: a systematic review. *Croatian medical journal*. Jun 2011;52(3):262-279.
17. Hansson MG. Building on relationships of trust in biobank research. *Journal of medical ethics*. Jul 2005;31(7):415-418.
18. Johnsson L, Eriksson S, Helgesson G, Hansson MG. Making researchers moral: Why trustworthiness requires more than ethics guidelines and review. *Research Ethics*. 2014;10(1):29-46.
19. Resnik DB. Disclosure of individualized research results: a precautionary approach. *Account Res*. Nov 2011;18(6):382-397.

20. Wendler D, Emanuel E. The debate over research on stored biological samples: what do sources think? *Arch Intern Med*. Jul 8 2002;162(13):1457-1462.
21. Beskow LM, Smolek SJ. Prospective biorepository participants' perspectives on access to research results. *J Empir Res Hum Res Ethics*. Sep 2009;4(3):99-111.
22. Shalowitz DI, Miller FG. Communicating the results of clinical research to participants: attitudes, practices, and future directions. *PLoS Med*. May 13 2008;5(5):e91.
23. Shalowitz DI, Miller FG. Disclosing individual results of clinical research: implications of respect for participants. *JAMA*. Aug 10 2005;294(6):737-740.
24. Knoppers BM, Joly Y, Simard J, Durocher F. The emergence of an ethical duty to disclose genetic research results: international perspectives. *European journal of human genetics : EJHG*. Nov 2006;14(11):1170-1178.
25. Wolf SM, Lawrenz FP, Nelson CA, et al. Managing incidental findings in human subjects research: analysis and recommendations. *J Law Med Ethics*. Summer 2008;36(2):219-248, 211.
26. Dressler LG. Disclosure of research results from cancer genomic studies: state of the science. *Clin Cancer Res*. Jul 1 2009;15(13):4270-4276.
27. Shalowitz DI, Miller FG. The search for clarity in communicating research results to study participants. *J Med Ethics*. Sep 2008;34(9):e17.
28. Fernandez CV, Kodish E, Weijer C. Informing study participants of research results: an ethical imperative. *IRB*. May-Jun 2003;25(3):12-19.
29. Ravitsky V, Wilfond BS. Disclosing individual genetic results to research participants. *Am J Bioeth*. Nov-Dec 2006;6(6):8-17.
30. Broadstock M, Michie S, Marteau T. Psychological consequences of predictive genetic testing: a systematic review. *European journal of human genetics : EJHG*. Oct 2000;8(10):731-738.
31. Beauchamp TL. Methods and principles in biomedical ethics. *Journal of medical ethics*. Oct 2003;29(5):269-274.
32. Wolffers I. Confidentiality in research. *Lancet*. Mar 2 1996;347(9001):620.
33. Trinidad SB, Fullerton SM, Bares JM, Jarvik GP, Larson EB, Burke W. Genomic research and wide data sharing: views of prospective participants. *Genetics in Medicine*. 2010;12(8):486-495.
34. Hiriscu IE, Stingelin-Giles N, Stadler C, Schmeck K, Reiter-Theil S. A right to confidentiality or a duty to disclose? Ethical guidance for conducting prevention research with children and adolescents. *European child & adolescent psychiatry*. 2014:1-8.
35. Clayton EW, Ross LF. Implications of disclosing individual results of clinical research. *JAMA*. Jan 4 2006;295(1):37; author reply 37-38.
36. Ormond KE, Cirino AL, Helenowski IB, Chisholm RL, Wolf WA. Assessing the understanding of biobank participants. *American journal of medical genetics. Part A*. Feb 2009;149A(2):188-198.
37. Joffe S, Cook EF, Cleary PD, Clark JW, Weeks JC. Quality of informed consent: a new measure of understanding among research subjects. *Journal of the National Cancer Institute*. Jan 17 2001;93(2):139-147.
38. Daoud M. 5% of rare analyses are assured in international labs. *Okaz (عكاظ)* ٢٠١٢ ,٢٠١٢/٠٥/٠٧). Riyadh; 7/5/2012.

39. National Committee of Medical & Bioethics (NCMBE). The law of ethics of research on living creatures. Riyadh: King Abdul Aziz City for Science and Technology; 2010.
40. The Council of Cooperative Health Insurance. *Regulations (Modified) for the cooperative health insurance system*. Riyadh; 2009.
41. Von Ferber L, McGavock H, Von Ferber C. Is confused thinking the cause of a non-existent dilemma? Current worries about patient confidentiality and epidemiological research. *Pharmacoepidemiology and drug safety*. 2000;9(7):587-589.
42. Iceland. Ministry of Welfare. *Biobanks Act*, No. 110/2000 as amended by Act No. 27/2008 and Act No. 48/2009. Iceland; 2009.
43. Estonia. Parliament. *Human Genes Research Act* Passed 13 December 2000 (RT I 2000, 104, 685), Enforced 8 January 2001. Changed with the next law 14.02.2007 (RT I 2007, 22, 111). Riigikogu; 2007.
44. King Abdulla International Research Center KAIMRC. *The Governance of Saudi Biobank*. Riyadh; 2011.
45. UNESCO. International Declaration on Human Genetic Data. *European journal of health law*. 2004;11:93-107.
46. Committee, Human Genome Organization (HUGO) Region. *Statement on human genomic databases*. London; December. 2002.
47. Organization, World Health WHO. *Genetic Databases: Assessing the Benefits and the Impact on Human & Patient Rights*. WHO, Geneva. 2003.
48. Godard B, Schmidtke J, Cassiman JJ, Ayme S. Data storage and DNA banking for biomedical research: informed consent, confidentiality, quality issues, ownership, return of benefits. A professional perspective. *European journal of human genetics : EJHG*. Dec 2003;11 Suppl 2:S88-122.
49. McClellan KA, Avar D, Simard J, Knoppers BM. Personalized medicine and access to health care: potential for inequitable access&quest. *European Journal of Human Genetics*. 2013;21(2):143-147.
50. Commission Human Genetics. *Whose hands on your genes*. London. 2000;22.
51. Forrest LE, Delatycki MB, Skene L, Aitken M. Communicating genetic information in families—a review of guidelines and position papers. *European Journal of Human Genetics*. 2007;15(6):612-618.
52. Lothen-Kline C, Howard DE, Hamburger EK, Worrell KD, Boekeloo BO. Truth and consequences: ethics, confidentiality, and disclosure in adolescent longitudinal prevention research. *Journal of Adolescent Health*. 2003;33(5):385-394.
53. Hens K, Dierickx K. The use of stored tissue samples from minors for genetic research: interviews with professionals. *New Genetics and Society*. 2010;29(3):329-342.
54. Roshanai AH, Lampic C, Rosenquist R, Nordin K. Disclosing cancer genetic information within families: perspectives of counselees and their at-risk relatives. *Familial cancer*. 2010;9(4):669-679.
55. Gaff CL, Clarke AJ, Atkinson P, et al. Process and outcome in communication of genetic information within families: a systematic review. *European Journal of Human Genetics*. 2007;15(10):999-1011.

56. Wiseman M, Dancyger C, Michie S. Communicating genetic risk information within families: a review. *Familial cancer*. 2010;9(4):691-703.
57. Sharaf RN, Myer P, Stave CD, Diamond LC, Ladabaum U. Uptake of genetic testing by relatives of Lynch Syndrome probands: a systematic review. *Clinical Gastroenterology and Hepatology*. 2013;11(9):1093-1100.
58. Gaudet D, Arsenault S, Belanger C, et al. Procedure to protect confidentiality of familial data in community genetics and genomic research. *Clinical genetics*. Apr 1999;55(4):259-264.
59. Kalra D, Gertz R, Singleton P, Inskip HM. Confidentiality of personal health information used for research. *BMJ*. Jul 22 2006;333(7560):196-198.
60. Lucassen A, Parker M. Confidentiality and serious harm in genetics—preserving the confidentiality of one patient and preventing harm to relatives. *European Journal of Human Genetics*. 2004;12(2):93-97.
61. Crook M. The risks of absolute medical confidentiality. *Science and engineering ethics*. 2013;19(1):107-122.
62. Chan TK. Doctors have a duty to breach patient confidentiality to protect others at risk of HIV infection. *BMJ: British Medical Journal*. 2013;346.
63. Soteriou T, Hek G, Gray S. Patient confidentiality, clinical data and NHS research—a researcher's guide. *Nurse researcher*. 2005;13(2):19-26.
64. Al-Gazali L, Hamamy H, Al-Arrayad S. Genetic disorders in the Arab world. *BMJ*. 2006;333(7573):831-834.
65. International Islamic Fiqh Academy (IIFA). Decision about medical confidentiality . 79 (8/10)1993. <http://www.fiqhacademy.org.sa/qarat/8-10.htm>. Accessed September 24, 2014.
66. Alahmad G, Dierickx K. What do Islamic institutional fatwas say about medical and research confidentiality and breach of confidentiality? *Developing world bioethics*. 2012;12(2):104-112.
67. Islamic Organization of Medical Sciences (IOMS). International Ethical Guidelines for Biomedical Research Involving Human Subjects-Islamic View. In: Islamic Organization of Medical Sciences, ed. *Islamic universal charter of medical health ethics*. Kuwait: Islamic Organization for Medical Sciences; 2005:129-301.
68. Wolf LE, Dame LA, Patel MJ, Williams BA, Austin JA, Beskow LM. Certificates of confidentiality: legal counsels' experiences with and perspectives on legal demands for research data. *Journal of empirical research on human research ethics: JERHRE*. 2012;7(4):1.
69. Bruggen M-C, Eytan A, Gravier B, Elger BS. Medical and legal professionals' attitudes towards confidentiality and disclosure of clinical information in forensic settings: a survey using case vignettes. *Medicine, Science and the Law*. 2013;53(3):132-148.

Chapter 6

The Ethics of Children Participation in Saudi Biobank: An Exploratory Survey

Alahmad, G., & Dierickx, K.

ABSTRACT

The ethical issues regarding children's participation in research biobanks has considerable interest today. Despite the existence of empirical literature on the ethics of pediatric research biobanking in different areas worldwide, no studies have yet explored the opinions on this issue in Saudi Arabia and the Middle East overall. A survey of 160 respondents from four equal different groups was conducted on this issue with researchers, physicians, medical students, and laypersons at King Abdulaziz Medical City in Riyadh, Saudi Arabia. The results show a clear and positive attitude toward pediatric clinical and genetic research inside and outside of Saudi Arabia. Parental consent is viewed as essential with 60% saying parental consent is sufficient for children up to 12 and 40% for children 12-18 years. More than 90% of the respondents preferred to gain approval from any child with decision-making capacity; 58.2% and 38.6% believe that children between 12 and 18 and people above 18 years, respectively, can understand and thus give their approval for genetic research. Clear majorities in the study agreed with re-consenting children when they become adults, allowing the child to withdraw at any time. A clear majority agreed that either parent can sign to give consent for a child to participate in a research biobank. We concluded that in varying degrees all four groups believe such elements of ethical consideration are critical. However, the group with the least understanding of research and research ethics had the smaller portion of respondents on the importance of having children involved in research. Even considering differences in religion, culture, and other factors, the study's results were consistent with results presented in the literature and research conducted in other countries.

Key words: Survey; Ethics; Biobank; Genetic research; Consent

INTRODUCTION

Conducting research on stored tissue is becoming very important these days. The use of stored tissue samples from minors has gained some

interest recently.^{1,2} However children's participation leads to different ethical challenges than that found in adult research biobanks.^{2,3} One of these distinctive challenges is related to a child's ability to make decisions in regard to participation in medical research and information sharing. There are many discussions about validity and sufficiency of parent consent and/or child assent in research biobanks,⁴⁻⁶ the suitable age for accepting child consent,⁷ child withdrawal^{2,6,8,9} and re-consenting of a child when reaching adulthood.^{2,10,11} Moreover questions are asked about the right to expose or share a child's information and whether there is any difference between medical and genetic information in relation to confidentiality.^{2,3}

A literature review showed many surveys querying the ethical challenges for participation in research biobanks,³ but most of them concentrate on adult biobanks,¹² and investigated professionals,¹³ patients,^{14,15} biobank participants¹⁶ or general public.¹⁷ Surveys regarding biobanking samples from children have been done with pregnant women,¹⁸ child patients after they had grown up¹⁹ and professionals.^{2,20}

Recently some countries in the Middle East have shown interest in establishing research biobanks, such as Saudi Arabia and Qatar, which include both adults and children. The Saudi biobank context is very different from other biobanks, particularly those in Europe and North America, because of the region's distinct social issues and its ethics system built on Islamic values. Saudi society is characterized by large family size (eight members on average),²¹ the presence of genetic isolates and semi-isolates, high rate of consanguinity, and the youthfulness of its population, with 32.5% being younger than 15 years old and only 2% above the age of 65 years.²¹ Considering these social parameters, variations in ethical challenges may appear in regard to research biobanks.

Very few surveys about research on stored samples have been conducted in the Middle East. Abou-Zeid A, et al. 2010 surveyed patients who are proxy participants of research in Egypt, obtaining the viewpoints of patients regarding stored sample research, including genetic samples.²² Also, Alahmad G, et al. 2014 conducted a qualitative study about the ethics of research on stored samples in the Middle East, including samples taken from children.²³

Given the importance of research on stored samples from children, the distinctive context of Saudi biobanks, and the lack of publications in this specific area, we found it necessary to query the opinions of Saudi professionals and biobank participants with regard to this clinical and genetic pediatric research. We asked about their opinion on the importance of research on stored tissue samples of children, the validity of parental consent and child assent, which parent has the right to consent, the child's right to withdraw and to be re-consented, and who has investigated their opinions regarding medical and genetic confidentiality inside and outside the child's family. This paper is a report of our findings.

METHODS

This is a cross sectional analytical study. A survey was conducted on a sample selected randomly from people working at or visiting King Abdulaziz Medical City "KAMC", Riyadh City. The sample included 40 medical doctors at King Fahad Hospital "KFH", 40 researchers at King Abdullah International Medical Research Center "KAIMRC", 40 medical students at King Saud bin Abdulaziz University for health Sciences "KSAU-HS", plus 40 visitors or patients' companions at King Fahad Hospital. In order to explore lay perspectives, visitors and patients' companions with medical backgrounds or those working in medical research teams were excluded. We continued collecting surveys until we reached 160 participants.

We created a structured questionnaire based on our interviews with professionals from the Middle East.²³ The questionnaire was drafted in English and pretested prior to data collection. Face validity was performed by revising the instrument's appearance to be a good measure of the concept being measured, which at the same time can be considered as a subtype of content validity. The content validity and feasibility of the questionnaire was ensured through consultation with various relevant experts: a medical doctor, a researcher in genetics, and a researcher in medical quality management at King Abdullah International Medical Research Centre. Several additions and amendments were made to ensure that the questions were relevant, clear, and valid in a Saudi context. The questionnaire was translated into Arabic, and the content was validated. The English copy was used with researchers, physicians, and students; while the Arabic copy was used with lay people.

All respondents completed the questionnaires by themselves, except for the lay people where interview-based questionnaires were used. The questionnaires were collected during an eight-month period by two trained research coordinators with the assistance of one medical student who helped collect surveys from medical students. No monetary or other incentive was afforded.

Reliability of the questionnaire was calculated using Cronbach's alpha to test for internal consistency, with the 31-item questionnaire receiving a consistency coefficient of 0.863, indicating a high degree of internal consistency. Test-retest reliability was ensured in a pilot study of 5 subjects before starting data collection.

The interview schedule consisted of two parts:

Part 1: The importance of research on children

This 4-item attitude statement scale evaluates the respondents' beliefs about the importance of research in general and biobanking research in particular, using a 5-point Likert scale ranging from strongly disagree, disagree, not sure, agree, or strongly agree. The respondents were asked to rate the importance of conducting such research in Saudi Arabia as well as in other countries.

Part 2: Parents informed consent and child assent in biobanking research

This part explored the attitude of subjects towards parent's consent, child's assent, re-consent, and withdrawal. Three items with scale from 1 to 18 years were used to determine the beliefs regarding age sufficiency of parent's consent alone, child assent alone, or both of them. A special item was created to determine the gender of parent who is entitled to sign the informed consent for the child, father alone, mother alone, any of them, both, and none of them. Three statements were used to determine the agreement on the need to re-consent the child when he/she becomes adult, modify consent information to be understandable by children, and respect a child's wish to withdraw; all measured on 5-point Likert scales.

Ethical Considerations

An ethical approval was received from the institutional review board of the National Guard Health Affairs, Riyadh, Saudi Arabia. All respondents

who agreed to participate were assured confidentiality. All respondents had the right to withdraw any time during the interview.

Statistical Analysis

The data were coded and analyzed using SPSS software version 19 in windows 7. A 5-point Likert scale was transformed to three point Likert scale for the purpose of analysis and the 5-point Likert scale was used to calculate the mean and standard deviation for quantitative analysis.

For inferential statistics chi square test (χ^2), student *t*-test, and paired sample *t*-test were used with a *p*-value of 0.05 as a level of significance.

RESULTS

Personal Characteristics

The study sample comprising 160 respondents from four different groups consisted of nearly the same numbers of men and women (table 1). Ages, having children, and educational levels were significantly different among these groups. Students were the least likely to have children.

Table 1: Socio- demographic characteristics of study sample

Professions		Physicians	Researchers	Students	Lay people	Total
Characteristics						
Age group (years)	18-40	77.5%	92.5%	100%	76.9%	86.8%
	>40	22.5%	7.5%	0.0%	23.1%	13.2%
	P-value ^a	$\chi^2 = 14.545, P = 0.002$				
Gender	Male	62.5%	27.5%	75%	40%	51.25%
	Female	37.5%	22.5%	25%	60%	48.75%
	P-value ^a	$\chi^2 = 22.114, P < 0.001$				
Having children	Yes	85%	82.5%	20%	82.5%	67.5%
	No	15%	17.5%	80%	17.5%	32.5%
	P-value ^a	$\chi^2 = 54.929, P < 0.001$				
Educational level	Secondary School and less	0%	0%	0%	20%	5%
	Diploma or Bachelor	0%	70%	82.5%	62.5%	54.1%
	Master and above	100%	30%	17.5%	17.5%	40.9%
	P-value ^a	$\chi^2 = 98.459, P < 0.001$				
Training in research ethics	Yes	64.1%	65%	52.5%	-	60.5%
	No	35.9%	35%	47.5%	-	39.5%
	P-value ^a	$\chi^2 = 1.622, P = 0.444$				

Data missing in some categories; percentages are calculated for those respondents from whom data were available. ^aPearson chi-squared.

All physicians had master's degrees or above, while the majority of the other three groups have only diplomas or bachelor degrees. A substantial minority of lay people had secondary school or less as a final degree.

Even though it is not significantly different, researchers had more training in research ethics compared with physicians and students.

Experience with Biomedical and Genetic Research Conducted with Adults and Children

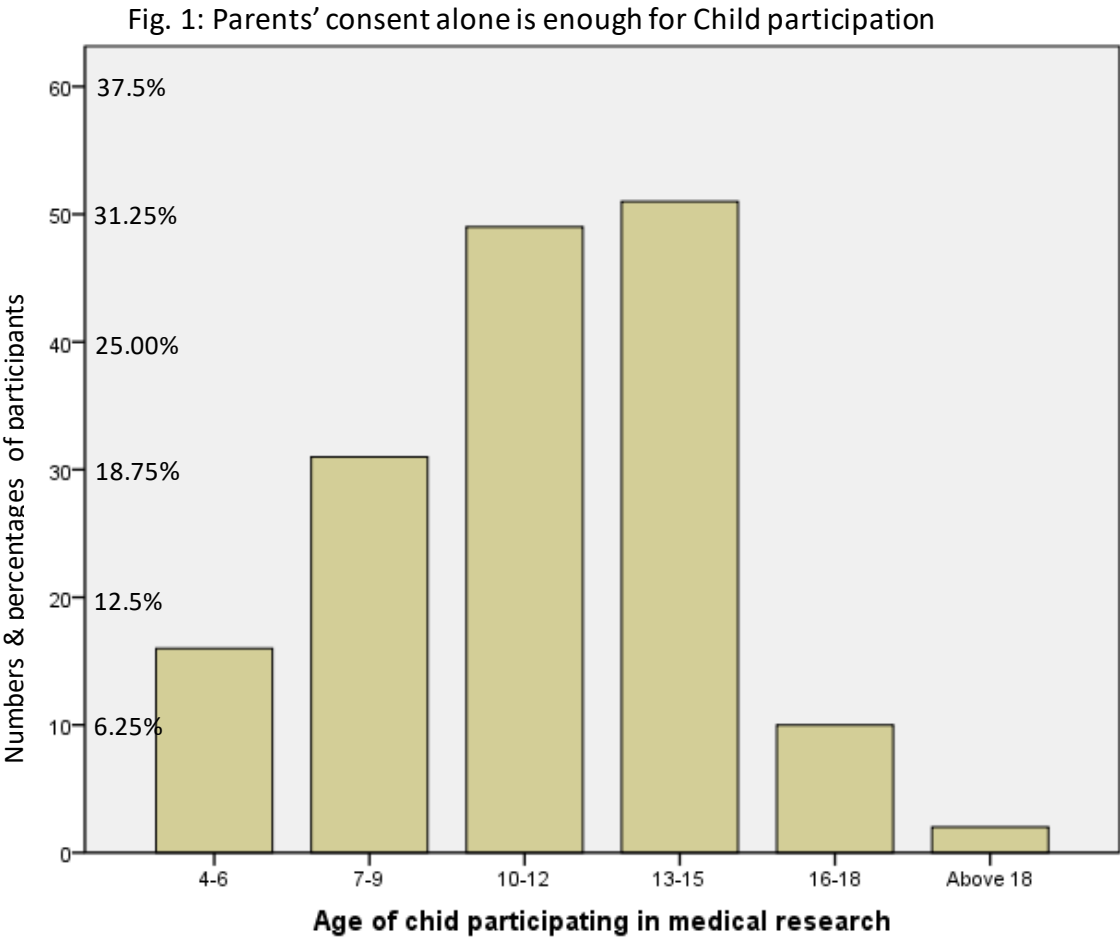
Descriptive statistics of respondents shows a high tendency to agree with the importance of clinical and genetic research conducted on (samples of) children, both generally and specifically in Saudi Arabia. The relation between profession and the importance of conducting clinical research in general was mildly significant ($p = 0.049$). Physicians agree to a higher degree compared with other groups, followed by researchers, students, and finally the lay people. The same results are seen regarding clinical research in Saudi Arabia and genetic research in general and in Saudi Arabia but without significant differences.

Table 2 Responses of participants toward the importance of research on children

		Conducting clinical research on children is important	Conducting clinical research on children in Saudi is important	Conducting research on samples of children is important	Conducting research on samples of children in Saudi is important
Physicians	Agree	97.5%	85.0%	85.0%	85.0%
	Don't know	0.0%	10.0%	10.0%	10.0%
	Disagree	2.5%	6.9%	5.0%	5.0%
Researchers	Agree	92.3%	87.2%	89.7%	87.5%
	Don't know	2.6%	7.7%	5.1%	7.7%
	Disagree	5.1%	5.1%	5.1%	5.1%
Students	Agree	90.0%	85.0%	87.5%	85.0%
	Don't know	10.0%	15.0%	12.5%	15.0%
	Disagree	0.0%	0.0%	0.0%	0.0%
Lay people	Agree	77.5%	67.5%	70.0%	67.5%
	Don't know	12.5%	15.0%	17.5%	15.0%
	Disagree	10.0%	17.5%	12.5%	17.5%
Total	Agree	89.3%	81.1%	83.3%	81.1%
	Don't know	6.3%	11.9%	11.3%	11.9%
	Disagree	4.4%	6.9%	5.7%	6.9%
P value	-	0.049	0.060	0.145	0.057

There is no significant difference between the importance of conducting clinical research in general and specifically in Saudi Arabia, as well in genetic research generally and specifically in Saudi Arabia. Most respondents agree on the importance of clinical research on a higher degree compared with research on samples either generally or in Saudi Arabia; none of these differences were significant. No significant difference could be found as well among the respondents who have or do not have children about the importance of clinical and genetic research inside or outside Saudi.

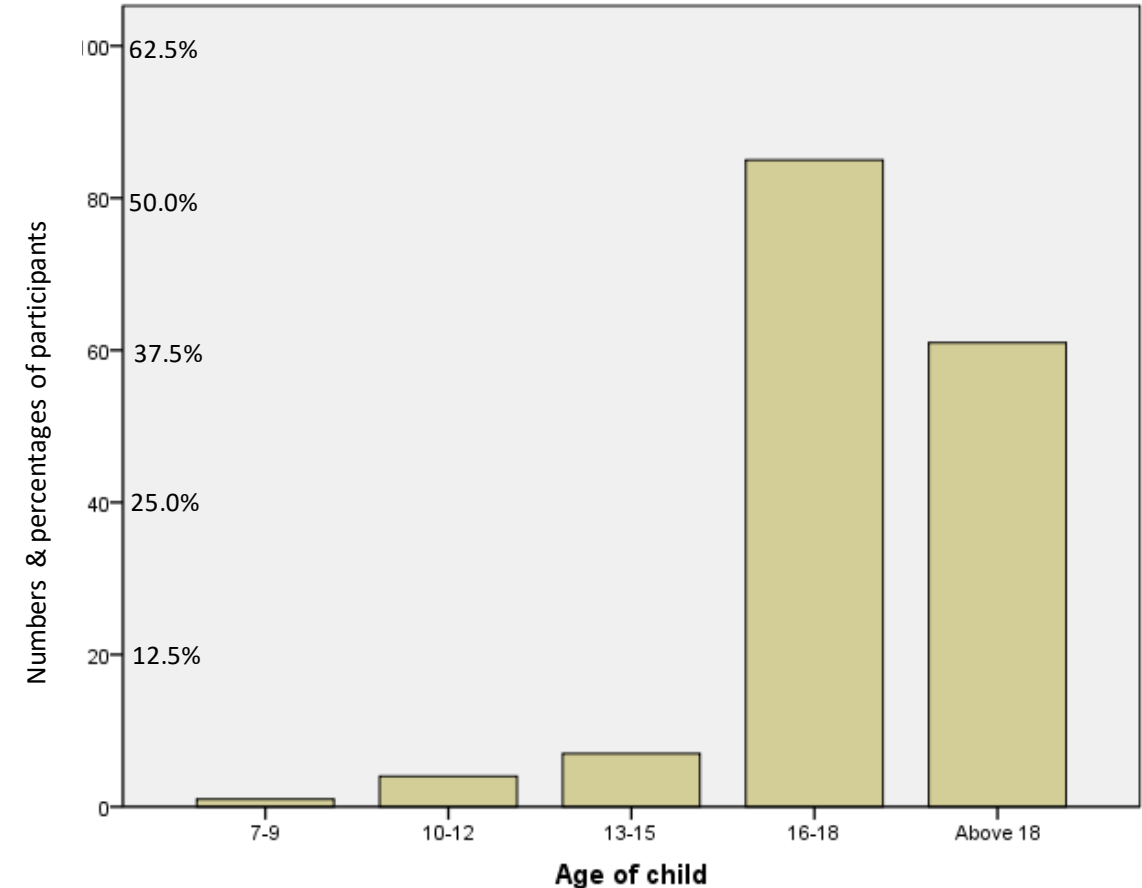
Attitudes towards Consenting for Research on Children



For research on children younger than 12 years, 60% of our respondents believe that parents’ consent alone is enough and that children should only participate in making decision after the age of 12 years (table 3). Moreover around 30% of respondents agree that assent is required

between age 10-12 years (figure 1). Around 40% of our participants believe that till the age of 18 years there is no need to discuss participation with children and that parents' consent is enough alone. Except for some students, all participants agree that for people above 18 years the consent of parents is not sufficient. We observe that the number of people who agree that the children above 12 years should assent is significantly different in lay people (82.5%) than in physicians (38.5%) and students (47.5%).

Fig: 2 Age at which Children Can Understand and Assent for Participation in Genetic Research



For genetic research 3.2% of all respondents believe that children under the age of 12 could understand and give their assent for genetic research while 58.2% believe that children can understand and give their assent when they are between 12 and 18 year old; however, 38.6% still believed that participants have to be over 18 years of age to be able to understand the research and provide consent. Regarding those who believe that children under 18 years can understand genetic research and give assent, the difference between lay people (66.7%) and physicians (55%) is

significant. For more than 50% of participants, minors between 16-18 years can understand and assent for genetic research (figure 2).

Almost 90% of all four groups agree without significant difference among groups on the importance of the following statements: child assent is important when he is able to do (91.9%), the Information must be adapted for minors (82.9%), re-consent when children become adults (90.5%) and respect the wish of the child of withdrawal (86.2%).

Table 3: Agreement on signing consent in association with different age groups of for consent and Child assent

	Profession	Child's age		People above 18
		Less than 12	12-18	
Till which age parents' consent is sufficient for child participation in research without child assent?	Physicians	38.5%	61.5%	0.0%
	Researchers	72.5%	27.5%	0.0%
	Students	47.5%	47.5%	5.0%
	Lay people	82.5%	17.5%	0.0%
	Total	60.4%	38.4%	1.3%
At which age child can understand genetic research and can give assent?	Physicians	0.0%	55.0%	45.0%
	Researchers	2.6%	61.5%	35.9%
	Students	7.5%	50.0%	42.5%
	Lay people	2.6%	66.7%	30.8%
	Total	3.2%	58.2%	38.6%

The number of respondents that agree that any parents can sign the consent on behalf of participating child (74.5%) is significantly higher ($p < 0.001$) than the other alternative options (both parents, father only, mother only and none of them). Fathers alone were preferred more than were mothers alone. No significant difference could be found among the professional groups ($p = 0.216$), or between the two genders ($p = 0.276$).

Table 4: percentages of who can sign informed consent for child participation in clinical and genetic research

Profession	Who do you think should sign informed consent for child participation in clinical and genetic research				
	Father only (%)	Mother only (%)	Both parents (%)	None of them (%)	Any parent (%)
Physicians	2.7	0.0	27.0	0.0	70.0
Researchers	10.3	0.0	25.6	0.0	64.1
Students	6.1	0.0	15.2	0.0	78.8
Lay people	5.0	2.5	5.0	2.5	85.0
Total	6.0	0.7	18.1	0.7	74.5

DISCUSSION

While this study comes from only one country, the results of this study may provide a reasonably complete guide for research biobanks in the Gulf region and in the Middle East in general. The majorities of communities in these countries are Muslim and share the same social and economic factors. They are characterized by a high percentage of children compared to communities of the Western world. Saudi Biobank includes respondents from varying ages, including children from the age of ten years. Other banks in the region are expected to include children within the other respondents; especially those biobanks in Gulf countries that have relatively small populations and that include the entire population, including children.

Knowing that Saudi is an Islamic country, respondents' views will be discussed in light of Islamic opinions expressed by fatwas released by official juristic councils.

Common Trends in Pediatric Research Attitudes

Results show a clear positive attitude in regard to pediatric clinical and genetic research, both inside and outside Saudi Arabia. This can be supported by knowing that the physicians and researchers working directly or indirectly at KAIMRC as one of biggest research centers in the region, where many educational activities related to medical research are organized for all kinds of professions, such as many courses about research methodologies, clinical trials, biobanking research plus many professional programs like "clinical research coordinators." The environment of the research was also implemented as a part of medical students' study components in both undergraduate and postgraduate standards, such as a two-week research summer school organized yearly for medical students. Opinions in Saudi are not affected negatively by historical medical research violations. We do not notice any major apparent medical scandals in Saudi as seen in Europe such as Nazi trials in the Second World War,²⁴ in the USA such as the Tuskegee experiment,²⁵ or even in other places such as the Trovan trial in Nigeria.²⁶

There is no significant difference of the positive attitude in regard to pediatric clinical and genetic research, both inside and outside Saudi Arabia among professional groups; however lay people give lower results, which could be explained both by their lower education and limited insight of clinical and genetic research, as seen in other studies.²⁷

Moreover, lay people usually concentrate on immediate benefits of research rather than final results as doctors do.²

Even so, the attitudes of lay people are positive, which is in line with a previous study conducted at the same place that showed that (68.8%) are willing to participate in clinical research,²⁸ and also with studies in other places, such as Sweden and USA.^{17,29} This might be explained by the fact that many lay people have educational degrees and they may understand the importance of research because of their degrees; moreover many of those interviewed had previously engaged with the health care system. They know that KAMC provides an advanced level of care and is a tertiary hospital where research leads to better care.

One could argue at this time that the lay participants who have children might believe that clinical and genetic research on children is an important issue.³⁰ Even participants without children agree on the importance of research on stored samples taken from children, since in the future they want to have children or if they have friends or family with a child with a medical concern.³⁰ However, in the sampling of 160 participants, it is unclear how many, if any, had children involved in research, sample collection, or biobanks. One could reasonably question whether parental status influenced responses to the issues of research and biobanks.²⁷ Would a person without children understand the ages and developmental abilities of the child well enough to make a reasonable decision about consent, denying consent, or the meaning of the research in the long-term? Another question that follows in logic is whether the parent views their child accurately or if they still see their child as a younger and less emotionally or developmentally mature than they are.² The parent's inaccurate view of the child could alter their willingness to allow a child to make the decision or take part in the decision.

Our participants do not feel that clinical research or research on stored human materials is more important in Saudi Arabia than in other places. A possible explanation is that Saudi people do not feel themselves to be different from other populations; besides, the Saudi facilities and patients usually get benefits from research conducted abroad.

This positive attitude regarding research on children and their samples is in line with International guidelines such as Declaration of Helsinki and the Council for International Organizations of Medical Sciences (CIOMS) guidelines,^{32,33} even though there are few regulations on research on

children and their samples in the Middle East.³³ Even though this study was conducted in a Muslim country, the highly positive attitudes of the respondents contrast with fatwa 67 (1992) of the International Islamic Fiqh Academy about prohibiting research on children.³⁴ However, the respondents' attitudes are in line with more recent fatwas that permit research on children, like fatwa 3/17 (2002) by Islamic Fiqh Council,³⁵ and fatwa No. 598 (2008) by Dar-Alifta Al-Misrriyah that allows research on children;³⁶ and also with fatwa No. 161 (2006) by IIFA,³⁷ and the opinion of International Islamic Organization of Medical Sciences that allows research on children in case of an exclusive or preponderant interest or an urgent need of the child or if it is absolutely necessary to conduct research on childhood diseases.³⁸

Consenting for Children's Participation in Biobanks

Parental Consent

Our respondents show highly positive attitudes regarding parental consent, with 60% saying parental consent is sufficient for children up to 12 years old and 40% between 12-18 years old. Lay people gave the highest agreement on that.

A parent consenting to the study on behalf of minor child is a common situation when children are involved in research.^{5,11,32} The intent of the consent is to provide the information in a manner that is easy to read and to understand the details of the research so the participant will be able to autonomously participate in research. The high percentages of agreement by lay people compared with other groups might be explained by considering the belief that children between 12 and 18 years of age can properly understand the information in informed consent.

The necessity of parent consent is also explicitly mentioned in some Islamic resources such as IOMS³⁸ and fatwas, such as fatwa No. 3/17 by the Islamic Fiqh Council,³⁵ fatwa No. 161 by the International Islamic Fiqh Academy³⁴ and fatwa No. 598 by the Dar-Alifta Al-Misrriyah.³⁷

Even for people older than 18 years, 1.3% of respondents said that parents' consent alone is enough, while 38.6% still believe that a child is unable to understand and to make decisions about participation without their parents' consent. This selection by respondents is related to common social factors in Saudi, where most of people will not become

independent just by becoming older than 18 years, they remain living with their families and depending on their parents in living matters. Thirty-eight percent of the respondents said the parents' consent is enough when the child is between 12-18 years. This is supported by other studies that show that children may face some difficulties in understanding and making decisions, as concluded by some authors.³⁹ Islamic resources do not specify the age at which consent of parents alone is enough.⁴⁰

Assent and Age of Understanding and Assenting

In relation to child assent for research participation, more than 90% of respondents prefer to have assent from the child who has decision-making capacity. And for the age of understanding and assent, 58.2% of respondents believed that children between 12 and 18 years can understand and give their assent for genetic research, while 38.6% still believe that people have to be older than 18 years to do that. The lay people were the most likely group to agree that children can understand and assent under 18 years.

Requiring assent by children supports the moral idea that these children have to play a role in decisions related to their health matters and is consistent with other studies.^{2,6,41} Getting assent from children is a reflection of respecting their autonomy.

Children can develop the ability to make such decisions about their health and give assent to participate in medical research at earlier ages.²⁸ Often a child who has a life threatening illness that could cause death can mature more quickly in his or her understanding of the significance of medical research. A child such as this may understand that if their tissue, blood, or other information is used long after their health struggle ends, the benefits for others is greater than their own.⁴² Even more, some other studies recommended involving children in participation decisions at very young ages.⁴³

The results fall in line with the normal development of children for understanding more complex ideas, following logic, and communicating at a higher level. Many individuals default to the age of majority when considering when a child has the right to consent. In some locations the age of majority may be as young as 16 but commonly is seen as 18 or above.^{2,24} Each country has their determining factors and as such, the cultural and legal aspects can vary. Involving children in decision making

is compatible with international documents such as CIOMS and the Helsinki Declaration, which mention the importance of considering child opinion.^{20,19} Also, CIOMS has stated that a child of 12-13 years old should be allowed to decide, which seems compatible with our results that only 3.2% of our respondents believe that people under 12 can understand and give assent.³² This can explain why the Saudi biobank set a minimum age of 10 years for allowing participation of children and getting assent from them.

Respondents' views match Islamic opinion as expressed by the Islamic Organization for Medical Sciences (IOMS) about the importance of having a child's assent.³⁷ No certain age is specified by Islamic authorities for a child to give assent for medical research;⁴⁰ rather, other factors, such as maturity and social development, play an important part in judging a child's decision making abilities. Islamic views consider the child's capacity for judgment as a main factor in allowing decisions made by children, and return defining the exact age of majority to the regulation of each country, which is different from country to country, although it is 18 years in Saudi, as an example.⁴⁴

Re-Consent

In regard to re-consenting children when they become adults, for the genetic research they are part of, a clear majority agreed that their previous participation was according their guardians' consent only. Therefore, upon reaching adulthood, the participants have the right to override the decisions their parents made for them when they were children.⁴⁵ Children must have the ability to state when and if they are willing to continue in the research, have the ability to withdraw, have the ability to consent if they are at an age and level to understand the consent, and must be able to as adults take over the consent abilities. However, re-consenting may face some technical difficulties related to success of contacting participants and their responses rate. Some biobanks consider the participants to have agreed to continue participating in the biobank when they become adults unless they come forward and declare their withdrawal, which is also the practice of the Saudi biobank.⁴⁶ There are no Islamic resources that address the issue of re-consenting for clinical research purposes when children become adults.

Withdrawal

When questioning the right to withdraw consent, the Majority of our respondents agreed with allowing the child to withdraw any time without any consequences not only after 18 years old but even before that.

A child should always have the opportunity to withdraw from a study no matter who signs the consent form.⁴⁷ If the child is uncomfortable with the study's intent, procedures, or other components, the child should have the right to withdraw from the study. The right to withdraw is not contingent on the person who consents to the study but to the person and in this case, the child actively involved in the study. Some even say that the withdrawal right is much more important for children than for adults considering that children participated in biobank according to parents' consent and not their own consent.²

Which Parent?

A clear majority of respondents agreed that any parent can sign the consent for a child to participate in a research biobank, followed by both parents together, fathers alone, and lastly mothers alone. No significant difference could be found among the professional groups.

In a previous study with genetic researchers from the Middle East consent of both parents together is preferred for child participation in research biobank, but with giving fathers priority over mothers in case of disagreement.²⁴ There are no other similar studies on this issue, except what had been written by Diekema about preferring not to perform any procedure in case of a disagreement between both parents.⁴⁸

For many individuals in any number of countries, the question of which parent should sign the consent form can bring confusion as to why it would matter which one signed. Any parent should have equal rights to sign off on a consent form. However, in reality there are different cultural and legal considerations involved in this question. In some societies, such as Saudi society where fathers have traditionally held the power of decisions in the family structure, the question is more justified; it is expected that fathers will be given priority; however, both parents were preferred by the majority.

In Islam, there is a certain orderliness of child guardians who have the right to make decisions on a child's behalf; they are only the males in the family: father, then grandfather, then brother.⁴⁹ However it is interesting

to see the majority of respondents prefer to get consent from both parents rather than fathers only, which also explains why a number of participants felt the father only should be the person consenting. However, this male preference from an Islamic point of view can be challenged, because limiting guardians to males only has not been stated in Islamic resources except in reference to guardianship in marriage and the inheritance of orphans.⁴⁰ Joint consent by both parents may be a good solution.

CONCLUSION

The conclusion of this study is overwhelmingly in favor of parents providing consent for children in research studies until a child is of age to provide their own consent. Any parent can give the consent, however small minority preferred fathers alone. The study demonstrated that the physicians had a greater response to the use of children in research studies. Respondents believed it was important to encourage children to take an active role in their involvement by deciding to continue if parents consented, withdraw if that is what they felt was right, and to ensure children could re-consent upon reaching adulthood, with adequate information of what that means. All the components of adults consenting to participate in research were critical for children in research but with an added element of allowing the children to withdraw, re-consent, and adapting all the consent materials to a level a child could understand. The study showed to varying degrees that all four groups believed these elements of ethical consideration are critical. However, the group with the least understanding of research and ethics involving research had a smaller portion of respondents seeing the importance of children involved in research. This demonstrates the importance of education regarding research, and specifically children in research, on the whole of society.

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Competing Interests

No fund is received for this study. The authors have declared that no competing interest exists.

REFERENCES

1. Gurwitz D, Fortier I, Lunshof JE, Knoppers BM. Research ethics. Children and population biobanks. *Science*. Aug 14 2009;325(5942):818-819.
2. Hens K, Nys H, Cassiman JJ, Dierickx K. Genetic research on stored tissue samples from minors: a systematic review of the ethical literature. *American journal of medical genetics. Part A*. Oct 2009;149A(10):2346-2358.
3. Samuël J, Knoppers BM, Avard D. Paediatric biobanks: What makes them so unique? *Journal of paediatrics and child health*. 2012;48(2):E1-E3.
4. Klima J, Fitzgerald-Butt SM, Kelleher KJ, et al. Understanding of informed consent by parents of children enrolled in a genetic biobank. *Genetics in Medicine*. 2013;141-148.
5. Hens K, Cassiman J-J, Nys H, Dierickx K. Children, biobanks and the scope of parental consent. *European Journal of Human Genetics*. 2011;19(7):735-739.
6. Holm S. Informed consent and the bio-banking of material from children. *Life Sciences, Society and Policy*. 2005;1(1):16.
7. Kaufman D, Geller G, Leroy L, Murphy J, Scott J, Hudson K. Ethical implications of including children in a large biobank for genetic-epidemiologic research: A qualitative study of public opinion. Paper presented at: American Journal of Medical Genetics Part C: Seminars in Medical Genetics 2008.
8. Hens K, Van El CE, Borry P, et al. Developing a policy for paediatric biobanks: principles for good practice. *European Journal of Human Genetics*. 2013;21(1):2-7.
9. Ries NM, LeGrandeur J, Caulfield T. Handling ethical, legal and social issues in birth cohort studies involving genetic research: responses from studies in six countries. *BMC medical ethics*. 2010;11(1):4.
10. Mucci N, Moore H, Brigham L, et al. Re: Biopreserv Biobank 11: 77–82.
11. Krishna R, Kelleher K, Stahlberg E. Patient confidentiality in the research use of clinical medical databases. *American journal of public health*. 2007;97(4):654.
12. Hens K, Snoeck J, Nys H, Cassiman J-J, Dierickx K. An exploratory survey of professionals on the use of stored tissue samples from minors for genetic research. *Genetics and Molecular Research*. 2010;9(2):973-980.
13. Ruiz-Canela M, Valle-Mansilla J, Sulmasy D. Researchers' preferences and attitudes on ethical aspects of genomics research: a comparative study between the USA and Spain. *Journal of medical ethics*. 2009;35(4):251-257.
14. Pentz RD, Billot L, Wendler D. Research on stored biological samples: views of African American and White American cancer patients. *American Journal of Medical Genetics Part A*. 2006;140(7):733-739.
15. Pulley JM, Brace MM, Bernard GR, Masys DR. Attitudes and perceptions of patients towards methods of establishing a DNA biobank. *Cell and tissue banking*. 2008;9(1):55-65.
16. Hoeyer K, Olofsson B-O, Mjörndal T, Lynöe N. Informed consent and biobanks: a population-based study of attitudes towards tissue donation for genetic research. *Scandinavian Journal of Public Health*. 2004;32(3):224-229.
17. Kettis-Lindblad Å, Ring L, Viberth E, Hansson MG. Genetic research and donation of tissue samples to biobanks. What do potential sample donors in

- the Swedish general public think? *The European Journal of Public Health*. 2006;16(4):433-440.
18. Joseph JW, Neidich AB, Ober C, Ross LF. Empirical data about women's attitudes toward a biobank focused on pregnancy outcomes. *American Journal of Medical Genetics Part A*. 2008;146(3):305-311.
 19. Goldenberg AJ, Hull SC, Botkin JR, Wilfond BS. Pediatric biobanks: approaching informed consent for continuing research after children grow up. *The Journal of pediatrics*. 2009;155(4):578-583..
 20. Jackson C, DIXON-WOODS M, Tobin M, Young B, Heney D, PRITCHARD-JONES K. Seeking consent to tissue banking: a survey of health professionals in childhood cancer. *European journal of cancer care*. 2009;18(4):391-400.
 21. Saudi Export Developing Center. Department of Statistics and Information. (2007). *Demographic Survey in 1428 AH (2007 AD)*. Riyadh, Saudi: Ministry of Economy and Planning; 2007.
 22. Abou-Zeid A, Silverman H, Shehata M, et al. Collection, storage and use of blood samples for future research: views of Egyptian patients expressed in a cross-sectional survey. *Journal of medical ethics*. 2010;36(9):539-547.
 23. Alahmad G, Dierickx K. Confidentiality, informed consent and children participation in research biobanks: Interview with professionals from the Middle East. 2014. (Accepted in Narrative query in Bioethics)
 24. Grabitz H. Problems of Nazi Trials in the Federal Republic of Germany. *Holocaust and Genocide Studies*. 1988;3(2):209-222.
 25. Reverby S. *Tuskegee's truths: Rethinking the Tuskegee syphilis study*: UNC Press Books; 2000.
 26. Ahmad K. Drug company sued over research trial in Nigeria. *The Lancet*. 2001;358(9284):815.
 27. Cousins G, McGee H, Ring L, et al. Public perceptions of biomedical research: a survey of the general population in Ireland. *Psychology Reports*. 2005;8.
 28. Al-Jumah M, Abolfotouh M, Alabdulkareem I, et al. Public attitude towards biomedical research at outpatient clinics of King Abdulaziz Medical City, Riyadh, Saudi Arabia. *Eastern Mediterranean Health Journal*. 2011;17(6).
 29. Mcquillan GM, Porter KS, Agelli M, Kington R. Consent for genetic research in a general population: the NHANES experience. *Genetics in Medicine*. 2003;5(1):35-42.
 30. Jenkins MM, Reed-Gross E, Rasmussen SA, et al. Maternal attitudes toward DNA collection for gene–environment studies: A qualitative research study. *American Journal of Medical Genetics Part A*. 2009;149(11):2378-2386.
 31. World Medical Association (WMA). Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA: the journal of the American Medical Association*. 2013;310(20):2191.
 32. Council for International Organizations of Medical Sciences (CIOMS), WHO. International ethical guidelines for biomedical research involving human subjects. In: Sciences CfIOoM, Organization WH, eds. Geneva: CIOMS; 2002.
 33. Alahmad G, Al-Jumah M, Dierickx K. Review of national research ethics regulations and guidelines in Middle Eastern Arab countries. *BMC medical ethics*. 2012;13:34.

34. International Islamic Fiqh Academy (IIFA). *Decision about medical treatment*. 67 (7/5). Vol 67. Jeddah 1992.
35. Islamic Fiqh Council (IFC). Stem cells. . 3 (17). Makkah 2002. <http://www.themwl.org/Fatwa/default.aspx?d=1&cidi=152&l=AR&cid=12>. Accessed September 24, 2014.
36. Dar Alifta Al-Misriyah. *Using stem cells in scientific experiments*. 598;2008.
37. International Islamic Fiqh Academy (IIFA). Decision about juridical regulation of biomedical research on human. . 161 (17/10). Amman 2006. <http://www.fiqhacademy.org.sa/qararat/17-10.htm>. Accessed September 24, 2014.
38. Islamic Organization for Medical Sciences (IOMS). International Ethical Guidelines for Biomedical Research Involving Human Subjects-Islamic View. In: Islamic Organization of Medical Sciences, ed. *Islamic universal charter of medical health ethics*. Kuwait: Islamic Organization for Medical Sciences; 2005:129-301.
39. Boddington P, Gregory M. Adolescent carrier testing in practice: the impact of legal rulings and problems with "gillick competence". *Journal of genetic counseling*. 2008;17(6):509-521.
40. Alahmad G, Dierickx K. Pediatric research ethics: Islamic perspectives. 2014.
41. Helgesson G. Children, longitudinal studies, and informed consent. *Medicine, Health Care and Philosophy*. 2005;8(3):307-313.
42. Hens K, Nys H, Cassiman JJ, Dierickx K. The storage and use of biological tissue samples from minors for research: a focus group study. *Public health genomics*. 2011;14(2):68-76.
43. Group BR. Patients' knowledge and expectations of confidentiality in primary health care: a quantitative study. *The British Journal of General Practice*. 2000;50(460):901.
44. Kuwait Ministry of Awqāf and Islamic Affairs State of Kuwait. *Al-Mausoha Al-Feqhia الموسوعة الفقهية*. Vol 45. Kuwait: Ministry of Awqāf and Islamic Affairs State of Kuwait; 2006.
45. Burke W, Diekema DS. Ethical issues arising from the participation of children in genetic research. *The Journal of pediatrics*. Jul 2006;149(1 Suppl):S34-38.
46. King Abdulla International Research Center KAIMRC. *The Governance of Saudi Biobank*. Riyadh; 2011.
47. Alderson P. *Young children's rights: exploring beliefs, principles and practice*: Jessica Kingsley Publishers; 2008.
48. Burke W, Diekema DS. Ethical issues arising from the participation of children in genetic research. *The Journal of pediatrics*. 2006;149(1):S34-S38.
49. Shankeeti M. *Ahkam Al-Jeraha Al-tebia (The rules of medical surgery)*. Jeddah: Maktabet Al-Sahaba; 1994.

PART III: A THEORETICAL ANALYSIS OF THE EXISTING GOVERNANCE OF THE SAUDI BIOBANK

Chapter 7

Confidentiality, informed consent, and children's research in the Saudi biobank governance: a comparative study

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ABSTRACT

This article outlines and discusses confidentiality, informed consent and children participating in the governance of the Saudi Biobank (SB), which is expected to be launched in 2014. We examined strengths and weaknesses of SB's governance as well as the similarities and differences with other biobanks, regarding three different ethical issues: confidentiality, informed consent and children's participation in research. We evaluated these issues in relation to international guidelines and Islamic law. The insights gained may be useful in developing national biobanking regulations in other Islamic countries, particularly in the Middle East.

INTRODUCTION

Today, research biobanks play a significant role in advancing medical science by offering the necessary elements for conducting research involving large numbers of samples and data. However, these research biobanks have created many new ethical challenges, such as giving broad consent rather than specific consent for each research study, risks from breaches in confidentiality from the use and handling of genetic samples and data, misusing genetic information, children's participation, and the lack of a direct benefit for biobank participants.¹ Consequently, scholars have studied these challenges to identify proper solutions and prevent negative effects. Many guidelines, laws and regulations concerning biobanks have appeared, with different standards, such as the UK biobanks governance (national guidelines),² the "*Guidelines for Human Biobanks and Genetic Research Databases*" by the Organization for Economic Co-operation and Development ([OECD], regional guidelines),³

and the "*International Declaration on Human Genetic Data*" by UNESCO (i.e., the declaration of UNESCO, international guidelines).⁴

The Saudi Biobank (SB) is a newly established national biobank. Other new national biobanks in Middle Eastern countries are either launched (Qatar biobank) or expected to launch in the near future, particularly in the Gulf region.⁵ The ethical standards and governance of any biobank are also affected by the societal ethos. The SB was built in a manner to respect Islamic values,^{*} Saudi law and international guidelines, as outlined by the SB governance.⁶ It is stated in the SB governance that a consideration will be given to Islamic resources to assure that SB is compliant with Islamic law, especially Quran, Sunnah and other resources like the decisions of juristic councils, such as the Council of Senior Scholars in Saudi Arabia and International Islamic Fiqh Academy. The International Ethical Guidelines for Biomedical Research Involving Human Subjects-Islamic view by the Islamic Organization for Medical Sciences⁷ is one of the references of SB governance. Furthermore SB governance considers as well the Saudi law of ethics of research on living creatures made by the National Committee of Medical & Bioethics. However there is no clear mechanism stated how to apply Islamic opinions driven from these resources on the SB governance.

No previous studies have discussed SB governance. Moreover, there is a lack of genetic or general research ethics concerning guidelines in the region.

This paper aims to perform a comparative analysis of SB governance with different types of western national or regional biobanks, particularly regarding the key topics of confidentiality, informed consent and children's participation and how they are translated in the Islamic context. This paper will help future biobanks in the Middle Eastern region, and areas with similar values and circumstances, to build their governance and benefit from the SB's strengths and weaknesses.

Saudi Biobank

The SB was established and co-financed by two governmental organizations: the King Abdul Aziz City for Science and Technology and the

^{*} Islamic values are driven by Quran teaching and prophetic tradition. The primary human basic values in Islam which are considered fundamental for good individual and social life include: life, reason, descent, property, and religion. Islam protects these human values and prevents any violation of them.

King Abdullah International Medical Research which is a part of the National Guard Health Affairs (NGHA). The SB project aims to conduct an extensive study on the influence of genes, environment and lifestyle in causing common diseases.⁸[8]

The SB plans to obtain samples and collect data from approximately 200,000 NGHA workers and their families. NGHA has four large hospitals and 60 health centers (primary or secondary) with a total capacity of 2,000 beds; it serves a community population of 2.5 million and approximately 60,000 patients a year.⁸ Muslims are 97.1% of the Saudi population.⁹

The NGHA offers the following advantages: a high quality health care system, new program development, IT resources and strategic development. These factors were important in selecting the NGHA as the SB headquarters.

Saudi Arabia has a high proportion of young people compared to Western nations as well as a different demographic. The under 40 years population in Saudi Arabia is approximately 78%, and 32% are under 15 years.¹⁰ Therefore, it was decided to include participants aged between 10 to 70 years.⁶

METHODOLOGY

This article concentrates on SB governance and how it addresses three basic ethical issues: informed consent, confidentiality, and children's participation. The components of each of these ethical issues were analyzed.

To make a proper evaluation of the SB governance, it was compared with governances of four different biobanks selected from biobanks that fulfilled the following criteria: national or regional biobanks established for research purposes; the ethical guidelines were accessible online to third parties from different countries; they varied in size; and participants ranged in age. The selected biobanks' governances are the governances of UK biobank,² Estonian Genome Project,¹¹ DeCODE genetics in Iceland,¹² and CARTaGENE in Quebec.¹³

Some international guidelines that address research biobank ethical issues are more general than explicit,¹⁴ therefore, we noted these guidelines but did not include them in our comparative result section,

however we refer to them in the discussion. These international guidelines included HUGO statement,¹⁵ the declaration of UNESCO,⁴ WHO report¹⁶ and the guidelines of the OECD.³

RESULTS

The reviewed biobanks represent a varied portrayal of biobanks. They differ in many aspects, including the establishment date and the number of participants and their ages. Each biobank has its own ethical system, which is guided by the general law in the country in which it is based. Our review concentrated on three issues: confidentiality, informed consent and children's participation.

Table 1: Confidentiality, informed consent and children participation in five different biobanks

		SB	UK Biobank	Estonian Genome Project	DeCODE genetics in Iceland	CARTaGENE
General information	Date of establishment	2011	2004	2001	1998	1999
	Number of participants	200,000	500,000	1,000,000	112,500	60,000
	Ages of participants	10-70 years	40-69 years	18 years and older	All	25-74 years
Confidentiality	Obligation of respect of Confidentiality		Yes	Yes	Yes	Yes
	Confidentiality Methods	Coding	Yes	Yes	Yes	Yes
		Access policy	Yes	Yes	Yes	Yes
		Security system	Yes	Yes	Yes	Yes
	Prohibition of discrimination		Yes	-	Yes	Yes
	Prohibition of stigmatization		Yes	-	-	-
Informed Consent	Obligation of informed consent		Yes	Yes	Yes	Consent is presumed
	Limited or general consent		General consent	General consent	General consent	Limited or a broad informed consent.
	Possibility of re-consent or re-contact		Yes	Yes	-	-
	Right to withdraw		Yes	Yes	Yes	Yes

	Applications of withdrawal	Three options: (1) No further contact. (2) No further contact and no more Samples. (3) Biobank can only use fully irreversible anonymized samples and data.	Three options: (1) No further contact. (2) No further access. (3) No further use.	Two stages: (1) before coding: withdrawal, (2) after coding: data destruction In unlawfully disclose: sample destruction	Tow conditions for samples: (1) to be destroyed or (2) not to be destroyed Data will remain	No more use of data, sample and destruction of codes
Children	Children participation	Yes	NA	NA	Yes	NA
	Guardian consent	Yes	NA	NA	Yes	NA
	Guardian	Any parent, but father has superiority in conflict of interest	NA	NA	Any parent	NA
	Child assent	Yes	NA	NA	Yes	NA
	When start getting assent	10	NA	NA		NA
	Consent when donor child becomes an adult	Continuous consent is assumed and child has the right to withdraw	NA	NA	-	NA

Confidentiality is a major concern in all the reviewed biobanks.^{2,6,11-13} Different protection mechanisms are employed to guarantee the confidentiality of personal information (see Table 1). The stored samples and data are coded and/or anonymized and kept under strict control, and they are protected by a good security system.^{2,6,11-13} Preventing discrimination (taking an action against or negative attitudes toward a person based on variations in his or her genome)¹⁷ is mentioned in the Icelandic, Estonian and Saudi biobanks but not to the same degree.^{6,11,13} In their informed consent, the Estonian biobank states, "No one may

discriminate against me on the basis of being or not being a gene donor."¹¹ The Icelandic biobank affirms avoiding discrimination: "It is prohibited to discriminate against a donor of a biological sample on the grounds of data derived from a biological sample."¹² In a special paragraph, the SB governance discusses preventing discrimination and outlines three levels, "Protection against any discrimination will be applied in the three levels: Individuals, families and tribes."⁶ The SB also mentions preventing any type of stigmatization (socially or economically categorizing people according to their attitudes, stereotypes, beliefs,¹⁸ or medical conditions).¹⁹

All biobanks are obligated to collect an informed consent from all participants prior to participation (see Table 1).^{2,6,11-13} The Icelandic biobank distinguishes between healthy volunteers who donate for research purposes and patients from whom samples are collected primarily for clinical reasons and will be used later for research. Written signed informed consent is needed in the former case, while it is assumed without the need of a donor's signature in the latter provided that the samples are not personally identified.^{*12} SB requires written informed consent in both cases.⁶ Informed consent must contain all the information that is required to enable the participants to make a voluntary decision. General consent covering all research in the biobank is used by all biobanks, except the Icelandic biobank, which provides two choices: either a limited consent for a specific research proposal or a one-time broad consent that cover future researches.^{2,6,11-13}

The SB, UK biobank and CARTaGENE allow re-contacting participants for the following reasons: to collect new information, to collect new consents for new uses, or to provide some results.^{2,6,13}

Withdrawal is a guaranteed right for all participants in all biobanks at any time without penalty (see Table 1). Both the SB and UK biobank use three degrees of withdrawals. The first degree in both biobanks is the same: not to have further contact; however 2nd and 3rd degrees are different. In the 2nd degree the UK Biobank will stop accessing samples and data, but the SB will continue accessing them without collecting new samples or contacting donors. The 3rd withdrawal degree in the SB and the

* Assumed consent according to Icelandic biobank is: "Consent that consists in the donor of a biological sample not expressing any unwillingness for a biological sample taken from him/her for a clinical test to be permanently preserved in a biobank for use under Article 9, information in writing on this possibility having been available to him/her"(12. Welfare Mo. Biobanks Act, No. 110/2000 as amended by Act No. 27/2008 and Act No. 48/2009. In: Welfare Mo, ed. Iceland2009.)

withdrawal of assumed consent in the Icelandic biobank do not refer to destroying samples, as is the case in the 3rd withdrawal degree in the UK biobank and other biobanks, including the withdrawal from expressed consent in the Icelandic biobank. Instead, the SB mandates making anonymization irreversible, and will continue using previously collected samples only after making them irreversible anonymized. The Estonian Biobank gives donors the right to withdrawal until coding is completed, but after that donors can apply, at any time, for the destruction of data which enables decoding. But in unlawfully disclosing, the gene donor in the Estonian Biobank has the right to apply for the destruction of the tissue sample, description of DNA and description of the state of health. For DeCODE genetics in Iceland upon withdrawal, the biological sample shall be destroyed. On withdrawal of assumed consent, the biological sample shall not be destroyed, but preserved for use in the interests of the donor. On withdrawal, any data existing in the database will remain, but no new data will be entered. In the CARTaGENE, no more use of data or samples besides of destruction of codes, except for previous statistical analyses and publications.^{2,6,11-13}

The Saudi and Icelandic biobanks are familial biobanks that recruit children (see Table 1). Participants in the SB are aged between 10 and 70 years. The UK, CARTaGENE and Estonian biobanks recruit participants aged 40-69 years, 15-74 years and 18 and above, respectively.

The Icelandic biobank and SB mandate parental consent for children aged 16 years and younger and 18 years and younger, respectively. For the SB, any parent can give the consent, however father has superiority in case of conflict of opinions. The children's assents are also sought when possible. None of them define the age of child when he can start giving his assent. SB does not ask consent or contact donor when they reach 18, but they can withdraw. The children will know about their participation either when they give assent or when their guardians notify them of participation.

DISCUSSION

Before discussing the current situation of Saudi Biobank, two important factors that might affect the ethics of Saudi Biobank need to be considered: Firstly, Islam, which is the religion of the majority, colors various aspects of life, including medical issues. Secondly, social characteristics and the tribal structure of the Saudi community still have

deep influences on people's social behavior. Extended families and consanguineous marriages are still common in Saudi. Although the effects of these two factors cannot be separated, they are interrelated and lead to certain types of customs in Saudi society. The precedence of male guardians in taking decisions related to children is an example where we can find both Islamic and social effects.

Considering this dual effect, Islamic and social effects, we will discuss three issues: confidentiality, informed consent, and research on children in Saudi Biobank, considering the international guidelines and governances of other national biobanks. Saudi Biobank aims to conform to international guidelines, as noted in SB governance; however, different variances can be seen also in other national biobanks, giving each biobank its own unique flavor.

Confidentiality

We observed that all biobanks, including the SB, insisted on respecting confidentiality, followed certain kinds of practical data protection procedures, and maintained information confidentiality by making the data inaccessible to biobank staff, insurers, and other parties. The interest shown in confidentiality by the SB and other biobanks reflects the importance of this issue. The collected samples and data contain a great deal of vital and sensitive information. Respecting information confidentiality is one of the ethical principles that are a primary concern of bioethicists who are interested in performing research in these fields.²⁰⁻²²

The SB uses International and national guidelines as references and grants confidentiality the level of importance matching what is stated in the "Law of ethics of research on human creations" by the Saudi "National Committee of Medical & Bioethics",²³ and international guidelines, such as HUGO, UNESCO, WHO databases, and OECD, which clarify that maintaining confidentiality is mandatory for all biobanks.

Another study shows that the Saudi law of research ethics indicates the need to respect confidentiality in medical research in general.²⁴ Moreover, this system particularly specifies respecting confidentiality of genetic materials biobanks.¹⁹ The SB governance is fully compatible with these materials and well matches the respect for confidentiality mentioned in Islamic fatwas.²⁴

It is expected that the tribal structure and the religion of Saudi society may have impact differently in regard to confidentiality. We observe that the SB focuses more on the issues resulting from breaches of confidentiality, such as discrimination and stigma. The Icelandic and Estonian biobanks also address preventing discrimination, but the SB is the only biobank that specifically addresses this issue in a particular paragraph. Moreover, the SB discusses preventing stigma. These preventions reflect the sensitivity of the SB against any type of discrimination or stigmatization caused by social values and the tribal structure of a community. Breaches of individual confidentiality may lead not only to individual stigma but also to familial and tribal stigmas.²⁵ In a society with such strong and extended families and a high percentage of inter-family marriages, any stigma would affect all family members and might adversely impact their daily lives and issues such as marriage. The concern regarding extended stigmas is supported by other studies about the high rate of consanguinity and genetically inherited diseases in Middle Eastern countries, such as in Saudi Arabia and among some other Muslim populations.^{26,27} On the other hand, there is also increased concern by Western authorities about protecting groups from disclosure of genetic information, especially after the harm that occurred to the Havasupai American Indian Tribe.^{28,29}

Preventing discrimination in the SB governance is supported by the law of ethics of research on living creatures (Article 36). There are no specific laws in Iceland and Estonia to prevent genetic discrimination;³⁰ however, both the Icelandic and Estonian biobanks mention preventing discrimination in their governance. Even though preventing discrimination has not been stated clearly in the governance of UK and CARTaGENE, many legal documents in the UK and Canada offer protection against any kind of discrimination, including genetic discrimination. In the UK, there is no specific law or legislation related to genetic discrimination rather, the legislators have merged the “Disability Discrimination Act 1995” into the “Equality Act of 2010,” and both of these include an anti-discrimination schema.³¹ Likewise, Canada has enacted laws such as, “Article 15 of the Canadian Charter of Rights and Freedoms,” “The Canadian Human Rights Act,” “The Tri-Council Policy Statement,” and PIPEDA (“About Genetic Discrimination”). Similarly, in Iceland, the parliament passed a bill in December of 1998, that permitted the creation of a consolidated record of all the Icelandic peoples concerning genealogy, genetics, and personal medical information.³²

Informed consent

Informed consent is considered to be a cornerstone of ethical practices in conducting medical research, including research biobanks. Informed consent is a reflection of an individual's autonomy, which is a basic principle of bioethics. Obtaining valid consent, free and voluntary participation and clear and adequate disclosure and understanding information are ethical prerequisites. The SB and other biobanks require informed consent from all participants. This policy matches the requirements of the Saudi law of research ethics, international guidelines such as the UNESCO Universal Declaration on Bioethics and Human Rights (2005) and others guidelines about research on stored materials.

One-time consent for all research conducted on donor samples and data has been selected by the SB. However it receives criticisms because the donors might not well be informed about future research, and the principle of autonomy might be undermined.³³ Although these critiques are recognized in literature, we see that one time consent matches the requirements written in international documents, and is in alignment with the findings of other authors of biobank studies.³⁴⁻³⁷ Moreover one time consent is the standard selected by many biobanks worldwide.¹² This might be due to the benefit of this one time approach. First, because getting informed consent for every research is impractical and may hinder progress.³⁸ Second, using some strategies such as adequate counseling of the donors and keep the door open for questioning and answering will help in making donors more acknowledged.³⁹ Moreover, even if the donor will sign for just once, research ethics committees should review and approve each research separately, and the donor should enjoy withdrawal right any time. Both ethics approval from an IRB and withdrawal right can offer protection to the donor.^{40,41}

The obligation to obtain informed consent before performing research in the SB is supported by Islamic perspectives. Although nothing is written in Islamic texts concerning biobanks, the research ethics guidelines issued by the Islamic Organization of Medical Sciences IOMS mandate requires informed consent before any medical research.⁷ In addition, Islamic fatwas issued by juristic councils support the obligation of informed consent, such as fatwa No. 161 (17:10) by the International Islamic Fiqh Academy (IIFA) about Islamic perspectives of medical research,⁴² the fatwa about stem cells (17:3) 2002 by the Islamic Fiqh Council (IFC),⁴³ etc. Moreover, a survey of guidelines showed that regulations in the Middle

East mandate informed consent.⁴⁴ Nothing is written about "one-time" consent in Islamic fatwas, as shown in a previous study. "One-time" consent does not contradict any Islamic laws.

Most international guidelines consider withdrawal without any adverse consequences to be the right of any participant in a research study. The SB offers three degrees of withdrawal, but none of them leads to a complete destruction of the samples and data. In the third degree of withdrawal which is a complete withdrawal the SB will completely anonymize the samples and data after receiving a withdrawal request, but it does not allow their destruction.⁶ The Declaration of UNESCO, WHO databases, and the HUGO statement provide two alternatives of complete withdrawal: either to destroy any unused samples and data or keep them but with full anonymization.^{4,15,16} The OECD mentions destroying the samples and data with respect to the cultural heritage and/or religious beliefs of the participant.³ The Singapore Tissue Network and CARTaGENE will destroy the samples, as will the UK biobank in its third degree of withdrawal except for previous analysis, while the SB will keep samples after they are completely anonymized. Estonian biobank will not destroy samples, but destruction may be applied if identity of gene donor is unlawfully disclosed. Clearly, sample destruction provides the best guarantee of a participant's protection, but it may result in the loss of effort and money. Although full anonymization cannot assure absolute protection, especially in case of abuse by key holders,⁴⁵ it can offer both protection and respect to a certain degree, especially in that donors will be informed before participating about impossibility of complete destruction of their samples when a withdrawal is requested. Whichever method is chosen, biobanks must make all possible policy and management efforts to guarantee sufficient protection. The multiple degrees of withdrawal in the SB are similar but not completely the same as those of the UK biobank.

Children's participation

The inclusion of children in research biobanks is widely accepted and necessary, especially to study pediatric childhood diseases and cases associated with childhood health.[46] Besides these conditions there is another reason behind selecting children to participate in SB, namely the high percentage of children in relation to the total population of Saudi Arabia, in which 77.5% of the population is under the age of 40, as

opposed to a ratio of 49.6% in the UK. Because of this demographic, it is important to study childhood diseases and respond to children's needs.

However, children are not simply small adults, and we cannot simply apply the results of research on adults to children. Children's participation in research raises different ethical challenges than for adults' participation. For example, research on children can be performed only if it addresses a medical problem related to a child's health. Other conditions for children's participation in research include: minimizing risks to children, considering the best interest of the child, obtaining guardian consent and—when appropriate based upon the age of the child—the child's assent as well.⁴⁶⁻⁴⁸ Many researchers distinguish between research on children and research on samples taken from children, especially regarding the minimum risks of both.^{49,50} The SB recruits participants aged between 10 and 70 years differently from many other biobanks, such as the UK and CARTaGENE. The process is similar to some other biobanks that recruit children among their participants, such as the Icelandic biobank. According to the declaration of UNESCO, WHO databases, and the OECD guidelines, research on children is allowed provided they are offered enough safeguards, and the guardian's consent is obtained. The SB guidelines also align with the OECD guidelines. Although the child's opinion is not obligatory, it must be respected, and his or her assent must be collected if it is possible.

Concerning research on children, the SB governance matches the predominate opinion stated in some Islamic resources regarding pediatric research, such as the fatwas of IIFA (161, 2006),⁴² ICF (3/17, 2002),⁴³ and the IOMS guidelines (2005).⁷ According to Islamic resources, pediatric research has to be in the best interest of the child and cannot cause more than minimal risks. According to IOMS the best interest of the child can be a direct individual benefit to the child himself, or indirect general benefit to the childhood community.⁷

The same conditions are stated in the Saudi "Law of Ethics of Research on Living creations". Islam as a reference can explain why SB gives superiority to fathers over mothers in case of conflict of interest. According to Islamic references fathers are guardian to their children.⁵¹ This is dissimilar to the case Iceland where the Biobank does not refer to which parent has the superiority, due to culture differences.

However, the question arises, why does the SB start recruiting participants at age 10? The Icelandic biobank and Marshfield Clinic Personalized Medicine Research Project have no minimum age limit to accept participants. There is no clear justification provided by the SB why the exact age of 10 years was chosen, particularly because children younger than 10-years-old form a significant portion of the population. It is interesting to see that SB defines 10 years as a minimum age for allowing research; the Saudi law of research ethics does not mention a minimum age.

Collecting assent from children for research biobanking is important and consistent with the ethical principle of respecting children's autonomy and including them in decision making. The necessity of obtaining a child's assent is supported by other studies, and it is mentioned in international guidelines about research ethics, such as the "Declaration of Helsinki,"⁵² the "International ethical guidelines for biomedical research involving human subjects" by the Council for International Organizations of Medical Sciences,⁵³ and the "Convention on the rights of the child" by the UN.⁵⁴ Saudi Biobank encourages but does not require child assent to allow children's participation in biobanks, and it seems that SB governance chooses the age of ten to ensure that participating children understand the biobank's principles and procedures, and they want the children to participate in the decision making process. The idea of understanding is also mentioned in the guidelines of other biobanks (e.g., West Australia). Guidelines by CIOMS state that from ages 12-13 the child's opinion should be taken into account.⁵³ However other studies define a higher age for the understanding of genetic research, and suggest an age of 16-18 years, while yet others give much lower ages, even as low as four years old for understanding their own medical issues.⁵⁵

None of the Islamic resources defines at which age medical research can be performed on children. According to a previous study, the authors could not find any Islamic fatwa about the age at which children can ethically be considered to be able to give an assent to medical research. That paper suggested collecting assent from children aged seven years and older.

CONCLUSION

The SB, which is based on international and national guidelines and Islamic religion shares same ethical values with other biobanks, and does not show major differences from other biobanks, although some dissimilarity could be found in some issues. Confidentiality is a sensitive concern, particularly when it relates to discrimination and stigmatization. Informed consent is another important issue in all biobanks. Differently from some other biobanks SB does not allow samples and data destruction in all withdrawal degrees. Participating of children in biobanking is important in Saudi, and can be offered the required protection. We suggest more discussion with scholars from other biobanks worldwide to reach better harmonization and collaboration. Governance of SB is one of the newly established health policies in the Middle East that regulates biobanking research and can be adapted partially or completely by other biobanks in the Arabic and Islamic worlds.

REFERENCES

1. Kaye J, Stranger M. *Principles and practice in biobank governance*: Ashgate Publishing, Ltd.; 2012.
2. UK Biobank. *Ethics & Governance Framework*. 2007. Stockport, England: UK Biobank; 2004. <http://www.ukbiobank.ac.uk/wp-content/uploads/2011/05/EGF20082.pdf>
3. Organisation for Economic Co-Operation and Development (OECD). *Guidelines for Human Biobanks and Genetic Research Databases*. Paris; 2009.
4. United Nations Educational, Scientific and Cultural Organization UNESCO. *International Declaration on Human Genetic Data*. *European journal of health law*. 2004;11:93-107.
5. Qatar Foundation's Biomedical Research Institute. Qatar Biobank. <http://www.qatarbiobank.org.qa/home/>.
6. King Abdulla International Research Center KAIMRC. *The Governance of Saudi Biobank*. Riyadh; 2011.
7. Islamic Organization of Medical Sciences (IOMS). *International Ethical Guidelines for Biomedical Research Involving Human Subjects-Islamic View*. In: Islamic Organization of Medical Sciences, ed. *Islamic universal charter of medical health ethics*. Kuwait: Islamic Organization for Medical Sciences; 2005:129-301.
8. King Abdulla International Research Center KAIMRC. Saudi Biobank. http://www.kaimrc.med.sa/index.php?option=com_content&view=article&id=31;%202013/.
9. Grim BJ, Karim MS. *The Future of the Global Muslim Population: Projections for 2010-2030*. Washington DC: Pew Research Center. 2011.
10. Saudi Export Developing Center. Department of Statistics and Information. (2007). *Demographic Survey in 1428 AH (2007 AD)*. Riyadh, Saudi: Ministry of Economy and Planning; 2007.
11. Estonia. Parliament. *Human Genes Research Act* Passed 13 December 2000 (RT I 2000, 104, 685), Enforced 8 January 2001. Changed with the next law 14.02.2007 (RT I 2007, 22, 111). Riigikogu; 2007.
12. Iceland. Ministry of Welfare. *Biobanks Act*, No. 110/2000 as amended by Act No. 27/2008 and Act No. 48/2009. Iceland; 2009.
13. The Sainte-Justine University Hospital Center. *CARTaGENE Governing Policies*. Montreal, Quebec (<http://cartagene.qc.ca/en/governance>, accessed 4 June 2014).
14. Vayena E, Ganguli-Mitra A, Biller-Andorno N. *Guidelines on biobanks: emerging consensus and unresolved controversies*. In: Elger B, ed. *Ethical issues in governing biobanks: global perspectives*. Ashgate Publishing, Ltd. 2008:23-35.
15. Committee, Human Genome Organization (HUGO) Region. *Statement on human genomic databases*. London; December. 2002.
16. World Health Organization WHO. *Genetic Databases: Assessing the Benefits and the Impact on Human & Patient Rights*. WHO, Geneva. 2003.
17. Epps PG. *Genetic Discrimination*. In: Post SG, ed. *Encyclopedia of Bioethics*. New York: Macmillan Reference; 2004:956 - 959.

18. Crocker J, Major B. Social stigma and self-esteem: The self-protective properties of stigma. *Psychological review*. 1989;96(4):608-30.
19. Corrigan O, Tutton R. *Genetic databases: Socio-ethical issues in the collection and use of DNA*: Psychology Press; 2004.
20. Giordano J, O'Reilly M, Taylor H, Dogra N. Confidentiality and autonomy: the challenge(s) of offering research participants a choice of disclosing their identity. *Qualitative health research*. Feb 2007;17(2):264-275.
21. Ashcroft R. The ethics of reusing archived tissue for research. *Neuropathology and Applied Neurobiology*. 2000;26(5):408-411.
22. Deschenes M, Cardinal G, Knoppers B, Glass K. Human genetic research, DNA banking and consent: a question of 'form'? *Clinical genetics*. 2001;59(4):221-239.
23. National Committee of Medical & Bioethics (NCMBE). *The law of ethics of research on living creatures*. Riyadh: King Abdul Aziz City for Science and Technology; 2010.
24. Alahmad G, Dierickx K. What do Islamic institutional fatwas say about medical and research confidentiality and breach of confidentiality? *Developing world bioethics*. 2012;12(2):104-112.
25. Brohan E, Slade M, Clement S, Thornicroft G. Experiences of mental illness stigma, prejudice and discrimination: a review of measures. *BMC health services research*. 2010;10:80.
26. Al-Gazali L, Hamamy H, Al-Arrayad S. Genetic disorders in the Arab world. *BMJ*. 2006;333(7573):831-834.
27. Aziz H, Akhtar SW, Hasan KZ. Epilepsy in Pakistan: Stigma and Psychosocial Problems. A Population-Based Epidemiologic Study. *Epilepsia*. 1997;38(10):1069-1073.
28. Mello MM, Wolf LE. The Havasupai Indian tribe case-lessons for research involving stored biologic samples. *New England Journal of Medicine, Forthcoming*. 2010 Jul 15;363(3):204–7.
29. Gahlinger PM. Existential pain: impressions from an American Indian reservation. *Journal of Pain and Palliative Care Pharmacotherapy*. 2006;20(2):41-52.
30. European Commission. *Screening report Iceland. Social policy and employment, Chapter 19*. Iceland; 17 October 2011.
31. Statutory Instruments, 2011 No. 2260. Equality. *The Equality Act, Chapter 15*. London: HMSO; 2010.
32. Privacy Commissioner of Canada. *Personal Information Protection and Electronic Documents Act*. S.C. 2000, c. 5. Assented to 2000-04-13. Butterworths Canada; 2010.
33. Hansson MG, Dillner J, Bartram CR, Carlson JA, Helgesson G. Should donors be allowed to give broad consent to future biobank research? *The lancet oncology*. 2006;7(3):266-269.
34. Eriksson S, Helgesson G. Potential harms, anonymization, and the right to withdraw consent to biobank research. *European Journal of Human Genetics*. 2005;13(9):1071-1076.

35. Hens K, Dierickx K. The use of stored tissue samples from minors for genetic research: interviews with professionals. *New Genetics and Society*. 2010;29(3):329-342.
36. Wendler D. One-time general consent for research on biological samples: is it compatible with the health insurance portability and accountability act? *Archives of internal medicine*. 2006;166(14):1449-1452.
37. Gibbons SM, Helgason HH, Kaye J, Nomper A, Wendel L. Lessons from European population genetic databases: comparing the law in Estonia, Iceland, Sweden and the United Kingdom. *European journal of health law*. 2005;12(2):103.
38. Lipworth W, Ankeny R, Kerridge I. Consent in crisis: the need to reconceptualize consent to tissue banking research. *Internal medicine journal*. 2006;36(2):124-128.
39. Steinsbekk KS, Myskja BK, Solberg B. Broad consent versus dynamic consent in biobank research: Is passive participation an ethical problem&quest. *European Journal of Human Genetics*. 2013;21(9):897-902.
40. Knoppers BM, Abdul-Rahman MnH. Biobanks in the Literature. *Ethical Issues in Governing Biobanks: Global Perspectives*. 2008:13-22.
41. Deschenes M, Sallee C. Accountability in population biobanking: comparative approaches. *The Journal of Law, Medicine & Ethics*. 2005;33(1):40-53.
42. International Islamic Fiqh Academy (IIFA). *Decision about juridical regulation of biomedical research on human*. . 161 (17/10). Amman 2006. <http://www.fiqhacademy.org.sa/qarat/17-10.htm>. Accessed September 24, 2014.
43. Islamic Fiqh Council (IFC). *Stem cells*. . 3 (17). Makkah 2002. <http://www.themwl.org/Fatwa/default.aspx?d=1&cid=152&l=AR&cid=12>. Accessed September 24, 2014.
44. Alahmad G, Al-Jumah M, Dierickx K. Review of national research ethics regulations and guidelines in Middle Eastern Arab countries. *BMC medical ethics*. 2012;13:34.
45. Elger B. Anonymization and coding. *Ethical Issues in Governing Biobanks: Global Perspectives*. 2008:167-188.
46. Gurwitz D, Fortier I, Lunshof JE, Knoppers BM. Research ethics. Children and population biobanks. *Science*. Aug 14 2009;325(5942):818-819.
47. Hens K, Levesque E, Dierickx K. Children and biobanks: a review of the ethical and legal discussion. *Human genetics*. Sep 2011;130(3):403-413.
48. Brothers KB. Biobanking in pediatrics: the human nonsubjects approach. *Personalized medicine*. 2011;8(1):71-79.
49. Hens K, Van El CE, Borry P, et al. Developing a policy for paediatric biobanks: principles for good practice. *European Journal of Human Genetics*. 2013;21(1):2-7.
50. Hens K, Nys H, Cassiman JJ, Dierickx K. Genetic research on stored tissue samples from minors: a systematic review of the ethical literature. *American journal of medical genetics. Part A*. Oct 2009;149A(10):2346-2358.
51. Shankeeti M. *Ahkam Al-Jeraha Al-tebia (The rules of medical surgery)*. Jeddah: Maktabet Al-Sahaba; 1994.

52. World Medical Association (WMA). Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA: the journal of the American Medical Association*. 2013;310(20):2191.
53. Council for International Organizations of Medical Sciences (CIOMS), WHO. *International ethical guidelines for biomedical research involving human subjects*. Geneva: CIOMS; 2002.
54. United Nation Human Rights. Office of the higher commitioner for Human Rights. *Convention on the Rights of the Child*. Geneva;1989.
55. Alderson P, Sutcliffe K, Curtis K. Children as partners with adults in their medical care. *Archives of disease in childhood*. 2006;91(4):300-303.

A Fair Access Policy for the Saudi Biobank

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In recent times, an increasing number of research biobanks have been established in many parts of the world, and medical research has increased as well.¹ Getting access to large numbers of samples and data is a key factor in the development of successful research, which requires collaboration between researchers and biobanks and among biobanks themselves and pharmaceutical companies.² However, this is accompanied by logistical difficulties and ethical challenges, especially those related to medical confidentiality. A good balance between allowing access to samples and data and conducting medical research on one hand, and preserving the rights of the participants—especially protecting the confidentiality and privacy of donors and not harming them—are key factors in the success of biobanks.³

In this section we'll explain the provisions under which researchers are allowed access to samples and data in a biobank in Saudi Arabia .

In 2011 King Abdul Aziz Medical City in the National Guard, in cooperation with the King Abdul Aziz City for Science and Technology, decided to establish a biobank, which currently contains 200,000 participants, as a base to conduct basic medical research in Saudi Arabia. Half of the participants were patients with certain common diseases, and the other half were healthy participants.⁴

The samples are collected on the basis that ownership is given to the biobank, with the possibility of allowing researchers to have access to the samples and the data they need to do their research. Samples and data will be managed by the biobank as a part of the King Abdullah International Medical Research. Access policy has been approved by the Steering Committee for the Saudi Biobank.⁵

Saudi biobank regulates access to samples and data, using a system of clear administration and procedures, including the use of double coding

to ensure the anonymity and limiting access to anonymized samples and data only. According to Saudi biobank, individual researchers and institutions can get access after obtaining an approval from the Institutional Review Board (IRB). Access is limited to samples and data needed by the researcher, and with previous approval by the IRB. Saudi biobank intends to encourage medical research while preserving confidentiality and protecting participants.⁵

Full implementation of the Saudi biobank is still underway, with an expected start in 2014. The program will give access to both local and foreign researchers, similarly to other biobanks such as UK, Icelandic, Estonian, and other biobanks.⁶⁻⁸ Previous study discovered widespread agreement to giving access to researchers inside and outside the country. Saudi biobanks as well as other biobanks require that information be anonymized to allow access.^{1,6-8}

Giving access to samples and data to local and foreign researchers is vital to the conduct and development of research in Saudi, especially because it offers the use of a large number of samples and data in research, which will increase the credibility of research results. On other side and from an economic point of view, giving access to researchers will save financial costs of establishing other biobanks requiring expensive buildings and equipment. Usually, research institutes and researchers are interested in investing in conducting research directly rather than spending money on building and costly tools. Giving access to researchers is important and acceptable, especially if done according to correct conditions and with appropriate safeguards for confidentiality and privacy through using anonymized samples and data.

REFERENCES

1. Bowton E, Field JR, Wang S, et al. Biobanks and electronic medical records: enabling cost-effective research. *Science translational medicine*. Apr 30 2014;6:234.
2. Hewitt RE. Biobanking: the foundation of personalized medicine. *Current opinion in oncology*. Jan 2011;23(1):112-119.
3. Hallmans G, Vaught JB. Best practices for establishing a biobank. *Methods Mol Biol*. 2011;675:241-260.
4. King Abdulla International Research Center KAIMRC. Saudi Biobank. http://www.kaimrc.med.sa/index.php?option=com_content&view=article&id=31;%202013/.
5. King Abdulla International Research Center KAIMRC. *The Governance of Saudi Biobank*. Riyadh; 2011.
6. UK Biobank. *Ethics & Governance Framework*. 2007. <http://www.ukbiobank.ac.uk/wp-content/uploads/2011/05/EGF20082.pdf>
7. Estonia. Parliament. *Human Genes Research Act* Passed 13 December 2000 (RT I 2000, 104, 685), Enforced 8 January 2001. Changed with the next law 14.02.2007 (RT I 2007, 22, 111). Riigikogu; 2007.
8. Iceland. Ministry of Welfare. *Biobanks Act*, No. 110/2000 as amended by Act No. 27/2008 and Act No. 48/2009. Iceland; 2009.

PART IV: ISLAM AND BIOBANKS

Chapter 8

Ethics of Research Biobanks: Islamic Perspectives

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Abstract:

Research biobanks can offer great benefits for science and health care. However, there arise many ethical challenges. These challenges may have different perspectives in Muslim countries, where some research biobanks start to appear.

We propose principles for good practice related to the research biobanks in Islamic countries, focusing on issues related to confidentiality, informed consent and children participation. These issues are explored according to Islamic fatwas and Usul Al Fiqh, we conclude by providing principles for good practice for policy makers of biobanks, researchers and anyone involved in dealing with stored tissue samples from Muslims. Actual implementation of the principles will vary according to different jurisdictions.

Introduction

Research biobanks are considered basic to clinical research these days and are expected to play an important role in the future.¹ They support studies of the relations between genes, environment and other factors to know the mechanisms and pathology of diseases and ways to have appropriate treatments.¹ However biobanks come with many ethical challenges, especially related to respect of the participants' autonomy, protection, and financial issues.^{2,3}

Research biobanks are beginning to appear in many countries in the Middle East, such as Saudi Arabia and Qatar, where Muslims form the majority of the population. However, the Islamic aspects of the related ethical issues have not yet been studied. A literature search in PubMed shows no results from the combination of “biobank” and “Islam” as keywords. Studying Islamic perspectives on research biobanks is also vital

in other countries, including Western countries where Muslim minorities form a significant part of society and Islamic perspectives are not well known by the staff of biobanks and by the Muslims themselves. There is a lack of literature that explains the ethical issues of biobanks from an Islamic point of view, and we hope that this paper will make a new contribution to the subject. Our paper will help both Muslim and Western scholars to understand the Islamic perspectives regarding research biobanks and the similarities and differences between them and other (especially Western) perspectives. We also aim to develop an Islamic opinion on research biobanks to be used as a reference by biobanks in Islamic countries, especially in the areas of informed consent, children's participation, and confidentiality.

Research Question and Methods

The ethical principles of medical research and research biobanks are a reflection of many ethical and moral principles, including society's ethos and morals. The ethics of research on a Muslim population are also influenced by Islamic perspectives.

A problem that may be noticed here is how the age of Islamic resources like the Quran (the holy book) and the Sunnah (the sayings, actions, approvals or descriptions of the features of the Prophet Muhammad), both of which date to more than 14 centuries ago, may say something about recent matters still being under discussion and negotiation. Such problematic issues can be solved from an Islamic point of view through knowing the mechanisms of rules stated in Islam. This can be seen as similar to other religions when they state an opinion about new matters such as cloning, disconnecting the ventilator, and other new similar issues

Even though the Quran and the Sunnah, the main resources of Islamic jurisprudence, do not mention medical research, biobanks, or other new developments, Muslim jurists use many mechanisms to derive rules about new matters and issues as Islamic resources. This process is called al-Ijtihad, which means "to make every effort to reach the correct decision". Al-Ijtihad is one of the principal characteristics of Islamic Jurisprudence. Although al-Ijtihad considers both the Qur'an and the Sunnah, it uses many tools, such as analogy, consensus, equitable preference, customs, and the public interest; all of these are called "Usul Al-Fiqh" (Source methodology in Islamic jurisprudence).⁴ There are many juristic rules. "Qawa'id al-Fiqhiyyah" concluded from "Usul Al-Fiqh" that are also used

in matters of daily life, such as: "Hardship begets facility," "Harm must be eliminated," "Necessity makes the unlawful lawful," "A greater harm is eliminated by means of a lesser harm," and others.⁴

Another problem comes from the differences among many Muslims groups, and when we say "Islamic perspectives," we must acknowledge a diversity of perspectives. However, in this paper we choose to talk about the Sunni School, although similarities exist among the different Muslim doctrines with regard to new juristic issues. The Sunni school represents a large majority (87 %–90 %) of Muslim populations.⁵ Although, many differences are found among the Sunni groups, especially in issues related to praying, fasting and others; it is different for new issues, such as organ donation, IVF and medical research, especially when that juristic councils are formed from (and have representatives of) all Sunni groups. Juristic councils' decisions, which we rely on in our studies, are cumulative opinions among majority of scholars in each juristic council.

In order to explain and evaluate Islamic opinions about research biobanking, we first surveyed the most prevalent ethical challenges in research biobanking through a review of the literature. Among the most relevant sources were: Hens et al., about children's research biobanks;⁶ Trommelmans et al. and White et al., about informed consent;^{7,8} and Alahmad and Dierickx, about the governance of research biobanks.⁹ Second, we reviewed Islamic institutional and individual fatwas* that may be connected directly or indirectly to research biobanks and their ethical challenges, including the International Islamic Fiqh Academy (IIFA), the Islamic Fiqh Council (IFC), and the Islamic Organization of Medical Sciences (IOMS). Three previous empirical studies in the Middle East about biobanking ethics were used to highlight Muslims' perspectives. Also, two theoretical studies—one about research ethics guidelines in Muslim countries and the second an analysis of Saudi biobank governance— are used to explore the real factual situation. Third, we used "Usul Al-Fiqh," including the Quran, the Sunnah, and other resources to analyze their Islamic opinions regarding research biobanking. We differentiated between two things: issues that Islam has a position on, and issues that Islam does not have any position on. We developed a model of

* *Fatwa* is an Arabic word used in Islamic jurisprudence, and means a religious opinion concerning Islamic law about a specific new matter issued by an Islamic scholar according to general Islamic perspectives and depending on the primary Islamic resources like the Qur'an, the Sunnah, consensus, and analogy, besides some secondary resources. The mufti (the person who issues fatwa) must be well informed about both Islamic jurisprudence and about the matter of the fatwa to be issued.

Islamic ethical standards that can be considered by biobanks in Islamic countries.

Before highlighting the ethical perspectives of research biobanking in Islam, a few simple questions are relevant, that is: what is the position of Islam toward medical research itself? And does Islam allow establishing research biobanks?

Islam and Medical Research

Islamic teachings do not limit scientific progress or development; on the contrary, they encourage progress. Many Quranic verses and prophetic Hadiths insist on both learning and teaching. Some Muslim interpreters of the holy Qur'an discuss the importance of learning new sciences when they interpret the verses of the story of Moses and how he learned from the good man.¹⁰ The International Islamic Fiqh Academy stated in the introduction of its decision 94 (10/2) on human cloning and in decision 142 (15/8) that Islam does not put any obstacle in the way of research, and requires respect for human dignity and privacy, as long as it is a beneficial research.^{11,12} Also, in its decision about human resource development 164 (18/2), it encourages doing research.¹³ This comes in line with a saying of Prophet Muhammad: "Seeking knowledge is the duty of every Muslim."¹⁴ Therefore, learning and finding new knowledge is a religious duty, not just a matter of necessity.

According to Muslim scholars, Muslims must fulfill two kinds of obligations. The first kind is a full obligation for every individual (e.g., to know how to pray or fast). If a person does not meet these obligations, he or she is sinful, regardless of other actions. This kind of obligation is called "fard al-'ayn" (individually required duty). The second kind of obligation is a partial obligation that is a partial imposition, where only part of a community and not all community members has to meet this kind of obligation. If this obligation is not met, the entire community is considered sinful. This type of obligation is called "fard al-kifaya" (collective duty), if fulfilled by a certain number it relieves others from performing it. The presence of doctors in a society is an example of this second type of obligation; having some doctors is in the public interest, but not all individuals have to be doctors.⁴

Medical research is in the public interest because it contributes to a better quality of life and decreases human suffering. Therefore, medical research represents the second type of obligation.

The understanding of the relationship between humans and diseases and the search for new means of treatment led Islamic civilization to a great scientific and medical renaissance during the Middle Ages. Integrated hospitals were created in Damascus, Baghdad, and Egypt. These understandings also fostered the emergence of a large number of Muslim doctors and scientists, including al-Razi, Ibn Sina, and Ibn al-Nafis.¹⁵

Although the teachings of Islam support medical research in general, we can identify some limits that regulate and define the boundaries of research for certain cases in which violations may occur. For any new matter, including medical research, to be permitted in Islam, five things must be protected: religious principles, life, money, intelligence, and offspring. Islam aims to preserve these five items.¹⁶

Islamic resources show that Islam relies on a sense of responsibility, with a special dimension of concern for social transactions (mu'amalat) with other parties. The Prophet Mohammad said, "Every one of you is a guardian, and responsible for what is in his custody."¹⁷ The meaning of this statement is that everyone in a profession has full responsibility for their profession; they must be good leaders and work for the benefit of their followers. We may apply this statement to medical research and biobanks: researchers and biobank staff are responsible for their research and their subjects, and they are responsible to society.

Research Biobanks Ethics

The literature presents many challenges facing research biobanks, such as informed consent, respect for confidentiality, informed consent and children participation in biobanks. The following sections of this paper will discuss these challenges from an Islamic point of view.

Confidentiality

Confidentiality is crucial in all human relationships and medical matters including medical research, and all medical workers and researchers have confidentiality as a major ethical concern and duty.¹⁸⁻²⁰ International ethics guidelines, such as the Declaration of Helsinki and the Belmont Report state the importance and obligation of medical confidentiality.^{21,22}

Research biobanks contain huge numbers of samples and personal and genetic data and offer easy and safe access to computerized medical information needed for research.^{1,23} The disclosure of individual information to the research participant has received a lot of discussion and debate since 1990s. Medical confidentiality is built on the concept of trust, which is considered necessary to conduct research.^{18,24} Genetic information holds a special importance because it is related to sensitive issues that may not only be attached to one person himself but also to the person's relatives. It is very essential to have a balance between the necessities of giving access to information for research purposes on one side and the obligation of respecting medical confidentiality on the other side. Any disclosure of medical information in clinical research or practice must be according to informed consent by participants to allow researchers to access or disclose any information related to participants.^{25,26} However, in some situations disclosing medical information without consent by research participants in research may be necessary to avoid greater harm, as in cases of clear individual or societal benefits like notification of infectious diseases, like AIDS.²⁷ Confidentiality is not limited to information provided by research participants, or taken from their samples or data, but also extends to the research results.^{28,29}

Even though sample and data information are supposed to be collected on an individual basis, in practice, it is not. All family members share similar genetic profiles; moreover, in some societies where the tribal system is still strong, like in many Muslim societies, the tribes have, to some degree, cognate genes. Potential stigmatization and harm will not be individual, but familial, and maybe tribal.³⁰ Furthermore, people who may wish not to be involved in research biobanking will be indirectly involved to some extent, through samples collected from their close relatives.

Many fatwas released by juristic councils have shown that respecting medical confidentiality is an important issue, both such general fatwas as the fatwa No. 79 by the IIFA,³¹ the fatwa (8/1) 33, and the fatwa (8/1) 35 by the Islamic Fiqh Academy in India,^{32,33} as well as fatwas specific to clinical research such as the fatwa No. 1 (15) by the IFC,³⁴ and the fatwa No. 161 (17/10) by the IIFA.³⁵ Besides these juristic fatwas, confidentiality is clearly stated in the document issued by the IOMS.³⁶ Besides these institutional fatwas and opinions about the importance of medical confidentiality, there are many individual fatwas by some scholars such as In Baz (the former grand Mufti in Saudi),³⁷ and writings by doctors such as

Albar and Chamsi Pasha.³⁸ On the other side, in spite of the importance given to confidentiality by institutional and individual fatwas, justification for breaching of confidentiality can be accepted in some situations, especially when the harm of maintaining confidentiality overrides its benefits, such report HIV-positive individuals to competent authorities in order to protect their relatives or community.^{31-33,39-41}

Informed consent

Confidentiality in research is essential because participants disclose personal information by the participants to the research team. This disclosure must be voluntary for the participants and obtained by using a complete informed consent form, preapproved by an Institutional Review Board. However, obtaining informed consent from the participants is a very complicated and controversial topic.⁴²⁻⁴⁴ A vast body of literature has been published discussing the significance, limitations, and inadequacy of informed consent in promoting voluntary participation in research.⁴⁵⁻⁴⁷

Some fatwas related to informed consent in clinical research, released by the International Islamic Fiqh Academy have included decision No. 67 (5/7) about medical treatment,⁴⁸ and decision No. 161 (17/10) about juridical regulation of biomedical research on humans.³⁵ According to these two decisions, informed consent is an obligation for all research. It must contain enough and understandable information. Decision making must be voluntary and the decision maker must be able to make the decision. Implied consent has the same value as expressed consent. According to IIFA decision No. 142 (15/8) a doctor is responsible in case harm occurs in the absence of informed consent.¹² The Islamic Organization for Medical Sciences (IOMS) agreed to these juridical decisions and provided more details about the obligation of informed consent and its required elements, such as benefits, risks, confidentiality, and other issues.³⁶ Many authors have talked about informed consent as an obligation in research, such as Albar, Chamsi Pasha, and others.^{38,49,50}

Research on children

Obtaining samples from children for the bio-repository is both crucial and problematic. Considering children's vulnerability and their need for greater protection, the inability to provide consent raises many ethical questions regarding their participation in research, considering very little or no direct benefits, and some inherent risk to be associated with it.

There are a lot of concerns about the proper age for a child to be able to give consent, and about who should give consent for minors and about the significance of children' assents.⁵¹

Few Islamic fatwas by juristic councils talked about medical research and children, besides an opinion by the IOMS.³⁶ Few number of individual writing are found about, but they only copied parts of IOMS opinion.^{38,49,50}

Three positions could be found about conducting medical research on minors. Two have opposite extremes: a complete prohibition by fatwa IIFA 67 in 1992,⁴⁸ because it is not in the best interest on child, a complete permission by the Islamic Fiqh Council Fatwa in 2002⁵² regarding stem cells and the fatwa by Dar-Alifta Al-Misrriyah, in 598 in 2008.⁶⁰ However the most famous opinion which has been selected by the IOMS and accepted by IIFA in the fatwa 161 in 2006 is that research on children is not allowed unless it is in the best interest of child or there is a public need to such research, without causing any harm to children, and after getting guardian consent and after the approval of ethics committee approval.^{35,36}

Discussion

Confidentiality, biobank & Islam

Respecting medical confidentiality is a basic issue in Islam. Many related institutional and individual fatwas are issued in this regard. By using one of the principles of "Usul Al-Fiqh" (source methodology in Islamic jurisprudence), called "Qiyas" (analogy), confidentiality is important in clinical practice and research and can be applied on biobanks as well, considering that the research in biobanks includes research on stored tissues, which is a kind of medical research. Moreover, confidentiality in biobanks is possibly more important than in clinical research because longitudinal studies last for decades, and because it deals with genetic information which is not individual information only but also familial and tribal, and any leak of information may lead to bigger harm. Disclosing of information may be justified for some reasons, especially to avoid larger harms, such as harms to at risk- relatives who share same genes. Many juristic rules in Islam can be used to allow such information disclosing like: "Necessity makes the unlawful lawful", which allows disclosing of information which is unlawful, but when it is necessary it becomes lawful

as the case of prevent public harm as stated by the fatwa of IIFA.³⁵ Disclosing of information in necessities is used by the governance of the Saudi biobank, which allows this disclosure in risky cases where there is a clear clinical proof, after making necessary consultation.⁵³ Interviews with professionals from the Middle East support this Islamic opinion about the importance of confidentiality in research on stored tissues and disclosing can only be accepted according to justified reasons,⁵⁴ which also is supported by the guidelines of research ethics in some Muslim countries in the Middle East.⁵⁵

Even there is no fatwas about preventing genetic discrimination and stigma in genetic research on stored tissues; there are many juristic rules "Qawa'id al-Fiqhiyyah" which can be applied here, such as: "Harm must be eliminated", "Harm may neither be inflicted nor reciprocated" and "The greater harm is repelled by the lesser harm".⁵⁶ These juristic rules clearly prevent harms. It is not a surprise to see that professionals in the Middle East agree that discrimination and stigma neither be accepted in genetic research.⁵⁴ The Saudi biobank also prevents any act that may lead to discrimination or stigma, this is also agreed by the research ethics regulations in the many Muslim countries, such as Saudi and Qatar.^{57,58}

Fatwas or juristic rules about confidentiality are stated in general terms; they do not show any interest in the mechanisms. We do not find anything about which security system or which kind of coding has to be selected. (Table 1)

Table 3: Islamic position about confidentiality in biobanking research

	Islamic position		
	Available Fatwa	Supported	Compatible with Usul AI-Fiqh methods
Respect of confidentiality	Yes		Yes
Justified disclosure of information	Yes		Yes
Prevent discrimination	No		Yes
Prevent stigmatization	No		Yes
Type of security system	No		Neutral
Type of coding	No		Neutral

Informed consent, biobank & Islam

Many juristic fatwas, the statements of IOMS, and many authors mandate getting informed consent to allow participation in clinical research,^{35,36,38,48-50} which is also applicable to biobanks. Informed

consent must be voluntary without any coercion. This opinion matches many juristic rules such as, “A person’s right is not to be revoked without his permission,” and “Man’s right is not to be used without his permission.” Voluntary participation requires using understandable informed consent and the ability to understand.^{35,36,48} Using written consent rather than verbal consent is preferred because it helps research participants to understand informed consent more clearly.³⁸

There is no preference in Islamic fatwas with regard to using one-time consent for all research conducted on the same samples, rather than a separate consent for each research. This issue is left to the system of each biobank. The Saudi biobank, as an example, chooses to use a one-time consent. The same is applicable to the degrees of withdrawal used by many biobanks like UK and Saudi biobanks; it also is left to the governance of the biobank.

Table 2: Islamic position about informed consent in research biobank

	Islamic position	
	Available Supportive Fatwa	Compatible with Usul Al-Fiqh methods
Obligation of informed consent	Yes	Yes
Voluntary	Yes	Yes
Ability to decide	Yes	Yes
Enough information	Yes	Yes
Understandable information	No	Yes
Withdrawal	No	Yes
Degrees of withdrawal	No	Neutral
One time consent	No	Neutral

Children’s participation, biobank and Islam

The position taken by the IOMS,³⁶ IIFA in its fatwa 161,³⁵ and many authors, seems to be applicable as well to children’s participation in research biobanks, considering that research on children’ biobanks are necessary to prevent and treat childhood diseases. All conditions mentioned by IOMS are presented: best interest of child or a public need for such research, no harm, guardian consent, and required approval of ethics committee.^{35,36}

Children’s participation in biobanks is crucial, and even though there may be no direct benefit to the participating child there are benefits to future generations and to the community of children. This public benefit justifies their participation, as stated by IOMS and IIFA 161.^{35,36} Moreover, the risk

in biobank participation is considered minimal, since the physical risk is limited to just a needle puncture or even less, as when collecting remaining samples taken from participants during their hospital visits. The risk of confidentiality breaches can be avoided by using good coding and effective security systems. Allowing children's participation in biobanks not only matches fatwas of IIFA³⁵ and positions of IOMS³⁶ but also is compatible with juristic rules of Usul Al-Fiqh, such as "do no harm" and "necessity makes the unlawful lawful," considering that children participation in research biobanks is necessary compared with minimum risks.^{6,59} Islamic resources do not define an age for children's participation in research, which is instead left to the governance of each biobank. The Saudi biobank, for example, accepts children from age 10 years.

A guardian's consent is needed to allow a child to participate in a biobank, and this is well supported by Islamic fatwas, like fatwas IFC 3/17, IIFA 161 and Dar-Alifta Al-Misrriyah (598), besides the opinion of IOMS and the authors cited in this study.^{35,36,38,52,60} However these fatwas do not define who can fulfill the role of guardian, which can be estimated from other resources that talk about guardianship in regard to issues such as orphans or marriage, namely: father, then grandfather, then brother.⁶¹ This guardianship is selected in some medical issues such as surgeries.⁶² Although some people, argue that mothers know and are concerned more about their children, women according Islamic law cannot be a guardian except if they are authorized by child legal guardian.⁶³

Table 2: Islamic position about children to participate in a research biobank

	Islamic position	
	Available Supported Fatwa	Compatible with Usul Al-Fiqh methods
Allowing research on children	Yes	Yes
At which age child can participate	No	Neutral
Guardian consent	Yes	Yes
Child assent	No	Yes
Best interest of child	Yes	Yes
Re-consent at adulthood	No	Yes
Who is the guardian	No	Yes

Juristic fatwas do not mention child assent: however, IOMS refers to the importance of a child's assent when he is able to give it.³⁶ According to Al-Mausoha Al-Feqhia (Juridical Encyclopedia) a child above 7 years may be able to understand and his assent can be accepted if it is according to his best interest.⁶¹ With respect to best interest of the child, no major harm,

child assent and guardian consent make participation in biobanks acceptable.

No fatwas refer to the necessities of research ethics approval, but this is mentioned by IOMS,³⁶ and matches the spirit of Islamic law by following the means that guarantee child protection, through requiring a review by experts.

Conclusion

Confidentiality, informed consent, and child participation are considered important challenges in research biobanks. In spite of differences in religion, culture, and other factors, ethical solutions show a lot of similarities.

Islam shows a clear interest in respecting confidentiality and preventing any kind of discrimination or stigmatization. Islam does not express any opinion regarding the coding method and security system, since these are practical issues that must be decided by each biobank.

Informed consent is considered an obligation for participation in a research biobank. This participation must be voluntary, and the informed consent must contain enough information and a suitable environment to allow the participant to make an informed participation decision. Withdrawal of consent is a right for every participant. Islam does not express any opinion on the degrees of withdrawal or whether collecting a one-time consent is sufficient or whether consent must be obtained for every research study.

Islam allows child participation in biobanks, but requires that no harm be tolerated, that a guardian gives consent, and that the child gives assent if he is able to do. No certain age is set for participation. Fathers are preferred to give consent.

Recommended Principles for good practice of biobanks: Islamic perspectives

1. Islam allows the establishment of research biobanks, as long as autonomy is respected, and harm is prevented.
2. Confidentiality must be respected.

3. No discrimination is allowed.
4. No stigmatization is allowed.
5. Informed consent is an obligation before participation.
6. Informed consent must contain all information needed to allow a participant to make a well-informed decision.
7. Participation must be voluntary.
8. One-time consent is not mandatory.
9. Withdrawal of consent is a right of every participant.
10. Degrees of withdrawal are up to every biobank.
11. Children can participate.
12. No harm is allowed for participating children.
13. A guardian's consent is essential, with fathers preferred.
14. The assent of the child is preferred when the child is able to do so.
15. A child must give consent upon becoming an adult to continue participating.

REFERENCES

1. Khoury MJ, Millikan R, Little J, Gwinn M. The emergence of epidemiology in the genomics age. *International journal of epidemiology*. Oct 2004;33(5):936-944.
2. Greely HT. Human genomics research. New challenges for research ethics. *Perspectives in biology and medicine*. Spring 2001;44(2):221-229.
3. Hansson MG. Combining efficiency and concerns about integrity when using human biobanks. *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*. 2006;37(3):520-532.
4. Al-Zarga A. *Sharh al-Kwae'd al-Fekehea (Enlightenment of Juristic Rules)*. Damascus: Dar al-Qalam.; 1989.
5. Miller T. Mapping the global Muslim population: A report on the size and distribution of the world's Muslim population. *Washington, DC: Pew Research Center*. 2009.
6. Hens K, Nys H, Cassiman JJ, Dierickx K. Genetic research on stored tissue samples from minors: a systematic review of the ethical literature. *American journal of medical genetics. Part A*. Oct 2009;149A(10):2346-2358.
7. Trommelmans L, Selling J, Dierickx K. The importance of the values attached to cells for a good informed consent procedure in cell donation for tissue engineering purposes. *Cell and tissue banking*. 2009;10(4):293-299.
8. White MT, Gamm J. Informed consent for research on stored blood and tissue samples: a survey of institutional review board practices. *Accountability in research*. Jan-Mar 2002;9(1):1-16.
9. Alahmad G, Dierickx K. Confidentiality, informed consent, and children's research in the Saudi biobank governance: a comparative study. *Eastern Mediterranean Health Journal*. 2014.
10. Kathir I. Tafsir Ibn Kathir. *English Translation by Shaykh Safiur Rahman al-Mubarakpuri, et. al of*. 1990:184.
11. International Islamic Fiqh Academy (IIFA). *Decision about human cloning*. . 94 (10/2). Jeddah1997.
12. International Islamic Fiqh Academy (IIFA). *Decision about doctor guarantee*. . 142 (15/8). Muscat2004.
13. International Islamic Fiqh Academy (IIFA). *Decision about Human Resource Development*. . 164 (18/2). Putrajaya2007.
14. Al-Albany MN. *Sahih Al-Jamea (Hadith No.3913)*. Beirut: Al-Maktab Al-Islami; 1990.
15. Abo Khalil S, Abadhah N. *Lawhat Mudheaa fi al Hadharah al Islamia (Bright pictures bin the Arab Islamic civilization)*. Damascus: Dar Al-Fikr; 2007.
16. Al-Bukhari MI. *Al-Sahih Aljamea (The correct total) Hadith No. 2558*. Beirut: Dar Ihya`a Al-Turath Al-Arabi.
17. Al-Bukhari MI. *Al-Sahih Aljamea (The correct total) Hadith No. 583*. Beirut: Dar Ibn Katherr, Yamamah; 1987.
18. Giordano J, O'Reilly M, Taylor H, Dogra N. Confidentiality and autonomy: the challenge(s) of offering research participants a choice of disclosing their identity. *Qualitative health research*. Feb 2007;17(2):264-275.

19. Gere C, Parry B. The flesh made word: Banking the body in the age of information. *BioSocieties*. 2006;1(1):41.
20. Ryen A. Ethical issues. *Qualitative research practice*. 2004:230-247.
21. World Medical Association (WMA). Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA: the journal of the American Medical Association*. 2013;310(20):2191.
22. The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. *The Belmont Report. Ethical Principles and Guidelines for the Protection of Human Subjects of Research*. April 18, 1979. <http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html>
23. Ethikrat D. *Biobanks for Research: Opinion*. Deutscher Ethikrat, Berlin; 2004.
24. Smith E. The limits of sharing: an ethical analysis of the arguments for and against the sharing of databases and material banks. *Accountability in research*. Nov 2011;18(6):357-381.
25. Wendler D. Consent for research with biological samples: one-time general consent versus a gift model. *Annals of internal medicine*. 2012;156(8):596-598.
26. Woodward B. Confidentiality, consent and autonomy in the physician-patient relationship. *Health care analysis : HCA : journal of health philosophy and policy*. 2001;9(3):337-351.
27. Beauchamp TL, Childress JF. *Principles of biomedical ethics*. 7th ed. New York: Oxford University Press; 2013.
28. Godard B, Marshall J, Laberge C. Community engagement in genetic research: results of the first public consultation for the Quebec CARTaGENE project. *Public health genomics*. 2007;10(3):147-158.
29. Renegar G, Webster CJ, Stuerzebecher S, et al. Returning genetic research results to individuals: points-to-consider. *Bioethics*. Feb 2006;20(1):24-36.
30. Baumann TK. Proxy consent and a national DNA databank: an unethical and discriminatory combination. *Iowa L. Rev*. 2000;86:667.
31. International Islamic Fiqh Academy (IIFA). *Decision about medical confidentiality* . 79 (8/10)1993. <http://www.fiqhacademy.org.sa/qarat/8-10.htm>. Accessed September 24, 2014.
32. Islamic Fiqh Academy-India (IFA-India). *The ethics and duties of a doctor*. . 33 (8/1). India1995. http://ifa-india.org/arabic.php?do=home&pageid=arabic_seminar8. Accessed September 24, 2014.
33. Islamic Fiqh Academy-India (IFA-India). *The ADIS and its rules*. . 35 (8/1)1995. http://ifa-india.org/arabic.php?do=home&pageid=arabic_seminar8. Accessed September 24, 2014.
34. Islamic Fiqh Council (IFC). *Genetic engineering*. . 1 (15)1998.
35. International Islamic Fiqh Academy (IIFA). *Decision about juridical regulation of biomedical research on human* . 161 (17/10). Amman 2006. <http://www.fiqhacademy.org.sa/qarat/17-10.htm>. Accessed September 24, 2014.
36. Islamic Organization for Medical Sciences (IOMS). International Ethical Guidelines for Biomedical Research Involving Human Subjects-Islamic View. In: Islamic Organization of Medical Sciences, ed. *Islamic universal charter of*

- medical health ethics*. Kuwait: Islamic Organization for Medical Sciences; 2005:129-301.
37. Ibn Baz A. *Fatawa Ibn Baz*. Vol 9. Riyadh: Dar Alwatan. 1996.
 38. Chamsi Pasha H, Albar MA. *Akhlaqiat al-Bouhoth al-Tibia (Medical research ethics)*. Damascus: Alkalam Press; 2008.
 39. Ahmad A. *Ifsha'a al-Sirr al-Tibbi wa Atharoh fi al-Fikh al-Islami (Breaching of Medical Confidentiality and its Affect in Islamic Jurisprudence)*: Collage of Shariah and Law, al-Azhar University; 2007.
 40. Arafea A. Sirr al-Mehna Wa Iltezam al-Tabeeb be Akhlaqiat al-Teb (Profession Confidentiality and Doctor's Observance to Medical Ethics). *al-Mutlaka al-Sihhi* 2001(19):16-18.
 41. Mubarak K. Hal yakshif al-Tabib sirr al-Maridh (Does the doctor expose patient's secret?). *al-Multqa al-Sihhi*. 2002(27):22-25.
 42. Clayton EW. Informed consent and biobanks. *The Journal of law, medicine & ethics : a journal of the American Society of Law, Medicine & Ethics*. Spring 2005;33(1):15-21.
 43. Helgesson G. Children, longitudinal studies, and informed consent. *Medicine, health care, and philosophy*. 2005;8(3):307-313.
 44. Secko DM, Preto N, Niemeyer S, Burgess MM. Informed consent in biobank research: a deliberative approach to the debate. *Soc Sci Med*. Feb 2009;68(4):781-789.
 45. Simon GE, Unützer J, Young BE, Pincus HA. Large medical databases, population-based research, and patient confidentiality. *American Journal of Psychiatry*. 2000;157(11):1731-1737.
 46. Boulton M, Parker M. Informed consent in a changing environment. *Soc Sci Med*. Dec 2007;65(11):2187-2198.
 47. Burgess MM. Proposing modesty for informed consent. *Soc Sci Med*. Dec 2007;65(11):2284-2295.
 48. International Islamic Fiqh Academy (IIFA). Decision about medical treatment. 67 (7/5). Vol 67. Jeddah 1992.
 49. Fadel HE. Ethics of Clinical Research: An Islamic Perspective. *Journal of the Islamic Medical Association of North America*. 2010;42(2).
 50. Abu Matar N. *Altajarob Alimia Ala Jism Alinsan (Scientific experiments on human)* [Master]. Gaza: Islamic Jurisprudence, Islamic University in Gaza; 2011.
 51. Burke W, Diekema DS. Ethical issues arising from the participation of children in genetic research. *The Journal of pediatrics*. Jul 2006;149(1 Suppl):S34-38.
 52. Islamic Fiqh Council (IFC). *Stem cells*. . 3 (17). Makkah 2002. <http://www.themwl.org/Fatwa/default.aspx?d=1&cidi=152&l=AR&cid=12>. Accessed September 24, 2014.
 53. King Abdulla International Research Center KAIMRC. *The Governance of Saudi Biobank*. Riyadh; 2011.
 54. Alahmad G, Dierickx K. Confidentiality, informed consent and children participation in research biobanks: Interview with professionals from the Middle East. 2014.

55. Alahmad G, Al-Jumah M, Dierickx K. Review of national research ethics regulations and guidelines in Middle Eastern Arab countries. *BMC medical ethics*. 2012;13:34.
56. Al-Zoheily MM. *Al-Qawed Al-Fiqhia wa Tatbeqatha Fi Al-Madares Al-Arbaa (Jurisprudence and its applications in the four schools)*. Damascus: Dar Al-Fikr; 2006.
57. National Committee of Medical & Bioethics (NCMBE). *Bylaw of ethics of research on the living creatures*. Riyadh, Saudi: King Abdulaziz City of Science and Technology; 2011.
58. Qatar. Ministry of Health. Regulations and Policies For Research Involving Human Subjects. Qatar: Ministry of Health; 2009.
59. Hens K, Dierickx K. The use of stored tissue samples from minors for genetic research: interviews with professionals. *New Genetics and Society*. 2010;29(3):329-342.
60. Dar Alifta Al-Misrriyah. *Using stem cells in scientific experiments*. 598;2008.
61. Kuwait Ministry of Awqāf and Islamic Affairs State of Kuwait. *Al-Mausoha Al-Feqhia (Juridical Encyclopedia)*. Vol 45. Kuwait: Ministry of Awqāf and Islamic Affairs State of Kuwait; 2006.
62. Shankeeti M. *Ahkam Al-Jeraha Al-tebia (The rules of medical surgery)*. Jeddah: Maktabet Al-Sahaba; 1994.
63. Al-Zoheily MW. *Al-Fiqh Al_islami Wa Adellato (Islamic jurisprudence and its evidence)*. Damascus: Dar Al-Fikr; 1985.

PART V: SUMMARY & RECOMMENDATIONS

Summary and recommendations

ABSTRACT

Research biobanks can offer great benefits for science and health care. However, they give rise to many ethical challenges. These challenges may have different perspectives in Muslim countries, where research biobanks have begun to appear. In this PhD project we have investigated ethical implications of research biobanks from an Islamic point of view. In this concluding chapter we first provide a summary of our findings. Next we formulate a set of recommendations that can be used or further elaborated by professional organizations in Islamic and Arabic countries. To conclude we point out the limitations of our research and indicate directions for further research.

SUMMARY OF FINDINGS

In the **introduction** we discussed how research biobanks raise many ethical issues, such as those related to confidentiality and privacy, informed consent, ownership, and child participation. Many Arabic and Islamic countries like Saudi Arabia have begun to establish research biobanks. These countries show many differences with other countries that may affect the way they deal with the ethical challenges of research biobanks. These differences are related to Islam, which is the religion of the majority, along with other factors such as societal and family structure. In the first part of this PhD project we reviewed and explored current research ethics and practices in the context of Islam and the Middle East. In the second part we conducted empirical inquiries into the current ethos of the Islamic community regarding confidentiality, informed consent, and research on children, using both qualitative and quantitative research. In the third part we analyzed the existing governance of the Saudi biobank, compared with the governance of other biobanks. In the fourth part we developed an Islamic opinion regarding research biobanks and formulated recommendations for research biobanks in the Middle East and in Islamic countries.

In **chapter 1** we explored medical and research confidentiality and potential ethical conflicts involving fatwas released by international, regional, and national Islamic Sunni juristic councils. We discuss how

these fatwas affect research and publication by Muslim doctors, researchers, and Islamic medical organizations. We documented fatwas in three categories: medical confidentiality, research confidentiality and justified breach of confidentiality. For fatwas that have already been issued, confidentiality seems to be a very important issue; however, these fatwas do not go far beyond general studies and do not fully investigate the issue of patient confidentiality. Additionally, there is a lack of accurate and detailed research about medical confidentiality, especially in sensitive areas, and in determining which cases may require an infringement of confidentiality. We argue that more specialized fatwas are needed to clarify Islamic juristic views about medical and research confidentiality, especially the circumstances in which infringements on this confidentiality are justified.

In **chapter 2** we discussed the Islamic position regarding research on children. We analyzed medical research on children from three Islamic resources: plural fatwas by juristic institutions, the opinions of Islamic medical organizations, and individual writings. Seven plural fatwas from three juristic councils could be found. Only four of them raise ethical concerns about research on children. Two documents from medical organizations were identified. Three different positions could be concluded from these fatwas: a total prohibition, prohibition unless, and permission. Preventing any harm is a major concern in all fatwas. A guardian's consent is necessary, but more details are needed. The guidelines of Islamic Organization of Medical Sciences (IOMS) reflect the best available Islamic perspective about research on children.

In **chapter 3** we reviewed the national research ethics regulations and guidelines in the Middle Eastern Arabic countries. Thirteen Arab countries in the Middle East were explored for available national codes, regulations, and guidelines concerning research ethics, and 10 documents from eight countries were found. We studied these documents, considering the ethical principles stated in the Declaration of Helsinki, the Council for International Organizations of Medical Sciences (CIOMS) guidelines, and the International Conference of Harmonization-Guidelines for Good Clinical Practice (ICH-GCP). Our paper comprises a complete list of protections, such as confidentiality, informed consent, ethics committees, and others. Results: This study found different levels and kinds of research ethics regulations and guidelines in the countries examined. Two groups can be distinguished: the countries in the first group have one or more research ethics regulations or guidelines, while the countries in the

second group have not yet established any. Most of the documents showed various degrees of deficiencies in regard to ethical protection. The majority of the documents that were examined refer to one or more international documents on biomedical research ethics. We concluded that recently a lot of efforts have been made in many countries in the Middle East. However, compared with international documents, most of the research ethics documents in use in this region demonstrate numerous deficiencies. These documents show extensive differences in regard to their development, structure, content, and reference to international guidelines.

In **chapter 4** we described our findings based on 12 in-depth interviews with professionals from the Middle East involved in or with ties to genetic research. Four themes were introduced during the discussion: research ethics regulations, confidentiality, informed consent, and child participation in research. We found few differences between those interviewed; their primary concerns were mainly similar to what is stated internationally; they generally believed that confidentiality protection is socially very important and that informed consent must be obtained from both adult and child participants. In addition, because most populations have a high percentage of children, and because children are not just small adults, but show important differences, the interviewed professionals strongly believed that it is imperative to include children in biobank research.

In **chapter 5** we described the findings of a survey conducted with 200 respondents at King Abdulaziz Medical City in Riyadh, Saudi Arabia, among five groups of equal size, which included researchers, physicians, medical students, donors, and laypersons. The majority of participants agreed that confidentiality is an important issue and that it is well protected in the Saudi biobank. All five groups showed different attitudes toward disclosing information to various third parties. They were in favor of allowing treating physicians, and to a certain extent family members, to have access to medical and genetic results from research. No significant difference was found between views on medical and genetic confidentiality. The majority of the respondents agreed that confidentiality may be breached in case of justified reasons. Even considering differences in religion, culture, and other factors, the study's results were consistent with results presented in the literature and research conducted in other countries.

In **chapter 6** we described the findings of a survey of attitudes toward ethical issues conducted on 160 respondents from four groups of equal size comprised of researchers, physicians, medical students, and laypersons, at King Abdulaziz Medical City in Riyadh, Saudi Arabia. The results show a clear and positive attitude toward pediatric clinical and genetic research inside and outside of Saudi Arabia. Parental consent is viewed as essential with 60% saying parental consent is sufficient for children up to 12 and 40% for children 12-18 years. More than 90% of the respondents preferred to gain approval from any child with decision-making capacity; 58.2% and 38.6% believe that children between 12 and 18 and people above 18 years, respectively, can understand and thus give their approval for genetic research. Clear majorities in the study agreed with re-consenting children when they become adults, and with allowing the child to withdraw at any time. A clear majority agreed that either parent can sign to give consent for a child to participate in a research biobank. We concluded that in varying degrees all four groups believe such elements of ethical consideration are critical. However, the group with the least understanding of research and its ethics had the smaller percentage of respondents that agreed on the importance of having children involved in research. Even considering differences in religion, culture, and other factors, the study's results were consistent with results presented in the literature and research conducted in other countries.

In **chapter 7** we described our findings of a comparison of the governance of the Saudi biobank (SB) compared with four different western biobanks: UK biobank, Estonian Genome Project, DeCODE genetics in Iceland, and CARTaGENE in Quebec. We examined strengths and weaknesses of SB's governance as well as the similarities and differences with other biobanks, regarding three different ethical issues: confidentiality, informed consent, and children's participation in research. We concluded that SB, which is based on international and national guidelines and Islamic religion, shares the same ethical values with other biobanks and does not show major differences from other biobanks, although some dissimilarity could be found in some issues. Confidentiality is a sensitive concern, particularly when it relates to discrimination and stigmatization. Informed consent is another important issue in all biobanks. Unlike some other biobanks, SB does not allow samples and data destruction in all withdrawal degrees. Participation of children in biobanking is important in Saudi, and can be offered the required protection. We proposed meeting with other biobanks worldwide for future collaborations, greater discussion, and harmonization. Governance of SB is one of the newly established health

policies in the Middle East that regulate biobanking research and can be adapted partially or completely by other biobanks in the Arabic and Islamic world.

In **chapter 8** we developed an Islamic opinion on research biobanks and formulated recommendations for research banks in Middle Eastern and Islamic countries. We applied our findings from all previous chapters to generate a normative reflection and develop an opinion about ethics of research biobanks that we think reflects an Islamic position on research biobanks. We concluded that Islam shows a great interest in respecting confidentiality and preventing any kind of discrimination or stigmatization. Islam does not express any opinion regarding the coding method and security system, since these are practical issues that must be decided by each biobank. Informed consent is considered an obligation for participation in a research biobank. This participation must be voluntary, and the informed consent must contain enough information and a suitable environment to allow the participant to make an informed participation decision. Withdrawal of consent is a right for every participant. Islam does not express any opinion on the degrees of withdrawal or whether collecting a one-time consent is sufficient or whether consent must be obtained for every research study. Islam allows child participation in biobanks, but requires that no harm be tolerated, that a guardian give consent, and that the child give assent if he is able to do. No certain age is set for participation. Fathers are preferred for giving consent for child participation.

RECOMMENDATIONS & CONCLUSION

Biobanks raise many ethical challenges for which researchers, policy makers, and philosophers have a duty to find solutions, and establish best practices that biobanks and their employees can follow. We show below the most important recommendations derived from our research.

Preamble

1. It is noticed that many Arabic and Islamic countries, especially the Gulf countries show a significant interest in medical research and in the establishment of research centers and biobanks as is the case in Qatar, Saudi Arabia, and others.

2. The dominant religion in these countries Islam, which affects the lives of people and their behavior and builds their positions. Laws in Arabic and Islamic countries must have no conflict with Islamic law.
3. Communities in these countries enjoy a set of customs, traditions and social norms, and have social and familial structure that must be considered and taken into account.
4. The increasing presence of Muslims in most countries around the world, including Western countries, makes it important for decision-makers in these countries to be aware of the concerns of this part of the population, especially about any modern issues that have an impact on the people's lives, as is the case with biobanks.

Research biobanks

There is a positive trend towards medical research done within an acceptable ethical frame. This positive position is supported by fatwas issued by Islamic juridical councils, and the opinions of the Islamic Organization for Medical Sciences (IOMS). Medical doctors and researchers agree also on the importance of conducting medical research, which also is acceptable by the research participants and lay people. The existence of solid ethical controls, will ensure against any deviation of medical research from its noble objectives, and guard against falling into ethical violations. Some Arab and Islamic countries already have established good research ethics guidelines, and many others are going in the same direction. The positive trend towards medical research is fully applied on in establishing research biobanks that must be controlled by a good ethical system.

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| <ol style="list-style-type: none">1. Establishment of research biobanks is important and allowed, as long as autonomy is respected, and harm is prevented.2. More, specific fatwas about research biobanks and their ethical standards are needed3. Updated and improved research ethics guidelines are needed in most of Arabic countries. |
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Confidentiality

Respect of confidentiality is an important ethical principle in the work of research biobanks generally, as well as those established in the Islamic world. Respecting confidentiality is consistent with Islamic fatwas of juristic councils and the regulation of medical research ethics. It is also supported by the opinions of researchers and medical doctors, besides

the opinions of research participants, who consider confidentiality an obligation. Because of tribal and extended family structure of many Muslim societies and the social customs, preventing any kind of discrimination or stigma has a great importance because the effect extends beyond individuals to families and societies.

4. Confidentiality must be respected.
5. No discrimination is allowed.
6. No stigmatization is allowed.

Informed consent

Participation in research biobanks is not allowed without a complete and correct informed consent from donors, which must be voluntary and with no coercion. Participants must also enjoy the right of withdrawal any time. Both informed consent and right of withdrawal match the perspectives of Islamic fatwas and research ethics guidelines besides the opinions of researchers, and research participants.

Using one-time consent in research biobanks rather than informed consent for each research proposal is preferred for both scientific and practical reasons, and it is accepted ethically and in Islamic thinking. The same is correct when it comes to multi-degrees of withdrawal.

7. Informed consent is an obligation before participation.
8. Informed consent must contain all information needed to allow a participant to make a well-informed decision.
9. Participation must be voluntary.
10. One-time consent is not mandatory but preferred.
11. Withdrawal of consent is a right of every participant.
12. Degrees of withdrawal are up to every biobank.

Child participation in research biobanks

Participation of children in research biobanks is important and necessary, especially in societies with high percentages of childhood. However, risks must be not more than minimum, a standard that biobanks readily endorse. There is no Islamic or ethical objection to child participation in research biobanks, and it is accepted according to the views of both researchers and lay people. Getting consent from parents is essential and

obligatory and having child assent is preferred when the child is able to give it.

13. Children can participate in research biobanks.
14. No harm is allowed for participating children.
15. A guardian's consent is essential, with fathers preferred.
16. The assent of the child is preferred when the child is able to do so.
17. More specific fatwas about child research is needed, especially about the minimum age to allow participation, who can sign consent, and others.

LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

We have several limitations in our research, and further research is needed in this field.

In studying Islamic opinion we relied mainly on Juristic fatwas, especially the International Islamic Fiqh Academy and the Islamic Fiqh Council, besides the document of the Islamic Organization of Medical Sciences. Although we tried to review individual efforts of Muslim scholars in this field we were not able to do an exhaustive search because no such search engines are available in the Arabic language like PubMed Google Scholars and others.

When studying the guidelines in Middle Eastern countries, restrictions on the data should be noted even though we used the most recent data available. Analysis of and comparison between the contents of the guidelines among national documents and international documents—such as defining minors, incompetent persons, benefits, risks, and so forth—cannot be performed in a precise manner because these guidelines are designed to provide concise and general ethical protections. Numerous ongoing efforts in establishing research ethics guidelines in Arabic and Islamic countries are not included in our study.

For our empirical studies, the qualitative research includes only 12 scholars from a few countries in the Middle East. Such results cannot be generalized to express the opinion of all Muslim Scholars. This is also true regarding the two quantitative studies conducted in Saudi. Thus, it would be important to increase the sample size and have samples from different regions in future research.

The governance of Saudi biobank, as analyzed in this study, cannot be assumed to represent the governance of other biobanks in the region or to express the factual situations of biobanks in Islamic and Arabic countries in general. More study across these countries is needed to provide a comprehensive understanding of the governance of their biobanks.

Scientific Summary

ETHICS OF RESEARCH BIOBANKS

ISLAMIC PERSPECTIVES IN AN INTERNATIONAL CONTEXT

INTRODUCTION

Research biobanks can offer great benefits for science and health care. However, they give rise to many ethical challenges. These challenges may have different perspectives in Muslim countries, where research biobanks have begun to appear. Although much has been written about ethics challenges of research biobanks, no literature discussing these challenges from Islamic perspectives could be found.

In this project we investigated the ethical issues related to medical/biobanking research in the context of Islamic and Middle Eastern countries. We especially focused on three issues: confidentiality, informed consent, and child participation in research biobanks, which are very important and under-researched issues in the Islamic and Middle Eastern world. Based on this investigation, we attempted to provide insight into the above-mentioned issues and recommend guidelines that can be used by fellow researchers, policy makers, and ethics committees in Islamic and Middle Eastern countries as well as other countries where Muslims are a component of society.

STUDY DESIGN AND RESULTS

Our inquiry and subsequent recommendations are based on four steps. In the first part we reviewed and explored the current research ethics and practices in the context of Islam and in the Middle East. In the second part we conducted empirical inquiries, using qualitative and quantitative research, into current ethos of the Islamic community regarding confidentiality, informed consent, and research on children. In the third part we analyzed the existing governance of the Saudi biobank compared with governance of other biobanks outside Middle Eastern and Islamic countries. In the fourth part we developed an Islamic opinion on research biobanks and formulated recommendations for the research banks in Middle Eastern and Islamic countries.

Part I: The state-of-the-art of current research ethics and practices are reviewed in the context of Islam and in the Middle East.

Our reviews were performed in two phases. In phase one, we investigated the influence of Islamic values on the issues of confidentiality and participation of children in clinical research. We explored patient confidentiality and potential conflicts with research practice in light of institutional fatwas released by international, regional, and national Islamic Sunni juristic councils. We discussed how these fatwas affect research and publication by Muslim doctors, researchers, and Islamic medical organizations. Next we investigated the guidelines from thirteen Arabic countries in the Middle East, considering the ethical principles stated in the international guidelines.

Part II: Empirical inquiries into current ethos of the Islamic community regarding confidentiality, informed consent, and research on children.

To review the opinion of medical professionals in the Middle East, we first performed semi-structured interviews with professionals who are actively involved in using stored tissue samples to perform genetic research. This qualitative study was followed by a survey among different professionals (medical doctors, students, and researchers), as well lay people who were participants in the Saudi biobank.

Part III: A theoretical analysis of the existing governance of the Saudi biobank.

Saudi Biobank governance was investigated and checked against the concepts and themes derived from the first and the second phase of this study. We examined the similarities, differences, strengths and weaknesses of the current governance of SB regarding three major ethical issues: confidentiality, informed consent, and children's participation in research, compared to some selected western national biobanks. We evaluated these issues in relation to international guidelines as well as Islamic law.

Part IV: Developing an Islamic opinion on research biobanks in Middle Eastern and Islamic countries.

Based on our research findings, we developed an opinion that reflects Islamic methods in reasoning and taking into account the fatwas reviewed.

Part V: Summary and recommendations

We presented a summary of our findings, and then we formulated recommendations regarding the use of stored tissue samples in the Middle East. These recommendations can be used by researchers, ethics committees, and policy makers.

Wetenschappelijke samenvatting

DE ETHIEK VAN BIOBANKEN

VOOR WETENSCHAPPELIJK ONDERZOEK

ISLAMITISCH PERSPECTIEF IN EEN INTERNATIONALE CONTEXT

INTRODUCTIE

Biobanken voor wetenschappelijk onderzoek kunnen grote voordelen bieden aan de wetenschap en de gezondheidszorg. Zij veroorzaken echter ook vele ethische problemen. Deze problemen kunnen een ander perspectief hebben in islamitische landen waar biobanken voor wetenschappelijk onderzoek beginnen te verschijnen. Hoewel er al veel is geschreven over de ethische problemen van biobanken voor wetenschappelijk onderzoek, zijn er geen publicaties te vinden waarin deze problemen vanuit islamitisch perspectief worden behandeld.

In dit project hebben we de ethische problemen in verband met medisch wetenschappelijk onderzoek met biobanken onder de loep genomen in de context van islamitische landen en het Midden-Oosten. We hebben ons vooral gefocust op drie problemen: vertrouwelijkheid, geïnformeerde toestemming, en de deelname van kinderen aan biobanken voor wetenschappelijk onderzoek. Dit zijn zeer belangrijke problemen in de islamitische wereld en het Midden-Oosten en ze zijn te weinig onderzocht. Op basis van dit onderzoek hebben we geprobeerd inzicht te geven in de eerder genoemde problemen en hebben we richtlijnen aanbevolen die kunnen worden gebruikt door mede-onderzoekers, beleidsmakers en ethische commissies in islamitische landen en het Midden-Oosten evenals andere landen waar moslims deel uitmaken van de maatschappij.

OPZET EN RESULTATEN VAN HET ONDERZOEK

Onze vraagstelling en de daaropvolgende aanbevelingen zijn gebaseerd op vier stappen. In het eerste onderdeel hebben we de onderzoeksethiek en –praktijk geëvalueerd en onderzocht in de context van de islam en het Midden-Oosten. In het tweede onderdeel hebben we empirische vragen gesteld met behulp van kwalitatief en kwantitatief onderzoek over het huidige ethos van de islamitische gemeenschap in het Midden-Oosten in

verband met vertrouwelijkheid, geïnformeerde toestemming en wetenschappelijk onderzoek bij kinderen. In het derde onderdeel hebben we het bestaande management van de Saudische biobank vergeleken met het management van andere biobanken, buiten het Midden-Oosten en islamitische landen. In het vierde onderdeel hebben we een islamitische visie ontwikkeld op biobanken voor wetenschappelijk onderzoek en hebben we aanbevelingen geformuleerd voor de biobanken voor wetenschappelijk onderzoek in het Midden-Oosten en islamitische landen.

Deel I: Het overzicht van de huidige ethiek van wetenschappelijk onderzoek, geëvalueerd in de context van de Islam en het Midden-Oosten.

Onze evaluaties werden in twee fasen uitgevoerd. In fase één hebben we de invloed van de islamitische waarden op de problemen van vertrouwelijkheid en deelname van kinderen aan klinische wetenschappelijke onderzoeken onderzocht. We hebben de geheimhouding van de patiënt en potentiële conflicten met de wetenschappelijke onderzoeksmethoden onderzocht tegen de achtergrond van institutionele fatwa's uitgesproken door internationale, regionale en nationale Sunni-islamitische juridische adviseurs. We hebben besproken welke invloed deze fatwa's hebben op het wetenschappelijke onderzoek en publicaties door moslim-artsen, -onderzoekers en islamitische medische organisaties. Vervolgens hebben we de richtlijnen van dertien Arabische landen in het Midden Oosten onderzocht, rekening houdend met de ethische principes in de internationale richtlijnen.

Deel II: Empirische vragen over het huidige ethos van de islamitische gemeenschap in verband met vertrouwelijkheid, geïnformeerde toestemming en wetenschappelijk onderzoek bij kinderen.

Voor de evaluatie van de houding van artsen in het Midden-Oosten hebben we eerst semi-gestructureerde interviews gehouden met artsen die actief zijn betrokken bij het gebruik van opgeslagen weefselmonsters voor het uitvoeren van wetenschappelijk genetisch onderzoek. Dit kwalitatieve onderzoek werd gevolgd door een enquête onder verschillende medische beroepskrachten (artsen, studenten en onderzoekers), en ook onder leken die hebben deelgenomen aan de Saudische biobank.

Deel III: Een theoretische analyse van het bestaande management van de Saudische biobank.

Het management van de Saudische biobank (SB) werd onderzocht en gecontroleerd aan de hand van de concepten en thema's afgeleid uit de eerste en de tweede fase van dit onderzoek. We hebben de overeenkomsten, verschillen, de sterke en zwakke punten van het huidige management van de SB bestudeerd in verband met drie belangrijke ethische problemen: vertrouwelijkheid, geïnformeerde toestemming en deelname van kinderen aan wetenschappelijke onderzoeken, in vergelijking met enkele geselecteerde westerse nationale biobanken. We hebben deze problemen beoordeeld aan de hand van internationale richtlijnen en van de islamitische wet.

CONCLUSIE EN AANBEVELINGEN

Deel IV: De ontwikkeling van een islamitische opinie over biobanken voor wetenschappelijk onderzoek en het formuleren van aanbevelingen inzake de banken voor wetenschappelijk onderzoek in het Midden-Oosten en islamitische landen.

Op basis van onze bevindingen over wetenschappelijk onderzoek hebben we een opinie ontwikkeld die de islamitische manier van denken en de geëvalueerde fatwa's weergeeft. Vervolgens hebben we aanbevelingen geformuleerd in verband met het gebruik van opgeslagen weefselmonsters in het Midden-Oosten. Deze aanbevelingen kunnen worden gebruikt door wetenschappelijke onderzoekers, ethische commissies en beleidsmakers.

Biography

Ghiath Alahmad has a Diploma of Doctor of Human Medicine (MD) (University of Damascus, Syria 1994), a specialization in Otolaryngology & Head and Neck surgery (Ministry of Health, Syria) and a Bachelor in Theology (Al-Fatih Islamic Institute, Syria).

In June 2007, Ghiath graduated with an advance Master of Bioethics (Erasmus Mundus: KU Leuven, RU Nijmegen, Università degli Studi di Padova). Since May, 2011, he is enrolled as a PhD candidate at the Centre for Biomedical Ethics and Law of the KU Leuven. His doctoral research project "Ethics of research biobanks: Islamic perspectives," falls under the promotion of Prof. K. Dierickx (CBMER)

Since February 2008 he has been working as a lecturer of bioethics at the King Abdulla International medical Research Center KAIMRC (Riyadh, Saudi).

List of Publications

Articles in internationally reviewed scientific journals:

Alahmad, G., & Dierickx, K. (2012). What do Islamic institutional fatwas say about medical and research confidentiality and breach of confidentiality?. *Developing World Bioethics*. <http://onlinelibrary.wiley.com/doi/10.1111/j.1471-8847.2012.00329.x/abstract;jsessionid=3ABA4DC563FF9AB3E003A033503D3D21.d04t04?deniedAccessCustomisedMessage=&userIsAuthenticated=false>

Alahmad, G., Al-Jumah, M., & Dierickx, K. (2012). Review of national research ethics regulations and guidelines in Middle Eastern Arab countries. *BMC Medical Ethics*, 13(1), 34. <http://www.biomedcentral.com/content/pdf/1472-6939-13-34.pdf>

Alahmad, G., & Dekkers, W. (2012). Bodily integrity and male circumcision. *Journal-IMANA*, 44(1). <http://jima.imana.org/article/view/7903/44-1-7048>

Al-Jahdali, H., Baharoon, S., Al Sayyari, A., & **Al-Ahmad, G.** (2012). Advance medical directives: a proposed new approach and terminology from an Islamic perspective. *Medicine, Health Care and Philosophy*, 1-7. <http://link.springer.com/article/10.1007%2Fs11019-012-9382-z?LI=true>

Alahmad, G., & Dierickx, K. (2012). Confidentiality, informed consent, and children's research in the Saudi biobank governance: a comparative study. Accepted in the: *Eastern Mediterranean Health Journals*.

Alahmad, G., & Dierickx, K. (2014). Confidentiality, informed consent, and child participation in research involving stored tissue samples: Interviews with professionals from the Middle East. Accepted in the: *Narrative enquiry of Bioethics*.

Alahmad, G., & Dierickx, K. (2014). Pediatric research ethics: Islamic Perspectives. Accepted in the: *British Journal of Medicine and Medical Research*

Alahmad, G., & Dierickx, K. (2014). Attitudes toward medical and genetic confidentiality in the Saudi research biobank: an exploratory survey (Submitted).

Alahmad, G., & Dierickx, K. (2014). The Ethics of Children Participation in Saudi Biobank: An Exploratory Survey (Submitted).

Alahmad, G., & Dierickx, K. (2014). Ethics of Research Biobanks: Islamic Perspectives (Submitted).

Book chapters, in internationally recognized scientific publisher:

Alahmad, G. (2013). Bioethics in Syrian Arab Republic. Compendium & Atlas of Global Bioethics (Handbook of Global Bioethics) - edit. Henk ten Have & Bert Gordijn, 2013,

Springer publishers, Netherlands.
http://link.springer.com/referenceworkentry/10.1007/978-94-007-2512-6_54

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Ghiath Alahmad (October 2014, Leuven, Belgium)